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MANUAL

THE

MANUAL FOR INVALIDS.

BY A PHYSICIAN.

FOURTH EDITION.

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PREFACE.

It has been too long the custom of writers on Popular Medicine, to direct their attention rather to sketching the outline of all the maladies "which flesh is heir to," than judiciously to unfold the true nature of health and of disease —lead the non-medical reader by the route which is open to reason—and, by thus placing the light on his path, enable him to see his own way. They have laboured rather to make a grammar of health, than to give available advice,—classing with precision, causes, symptoms, and remedies for cure; but leaving the patient to apply them without judgment—as one would direct a blind man on his way, by describing to him

minutely the road-side scenery through which he was to pass.

The object of the writer of this Manual, is to instruct his fellow creatures, first to know what health consists of, —then to lead their judgment to the care of it while it is in their possession, and to the regaining of it when disease may have deprived them of it. So various are the shades in disease—so complicated the circumstances accompanying it,—that, to place a list of treatises on acknowledged divisions in the hands of a non-medical reader, must be, if not dangerous, at least of little use. But to lay before him a series of instructions and advices, drawn up with a view to open his mind to his true state regarding health—to enable him to say, "*Thus far should I go, and no farther: here I can assist my health, and here should consult my physician;*"—this surely is desirable. To this one great object, then, is the "Manual for Invalids"

directed; and the writer trusts, that a long life devoted to the study of the laws of the animal economy, and to the circumstances which precede the change from health to disease, has qualified him for the task he thus undertakes. He also trusts, that his book will be read with interest alike to those in health and in disease; that it will bear to be read "twice and again," by the invalid; that it will instruct as well as interest; and that the reader, above all, will derive practical benefit, as regards the greatest of all human blessings—Health.

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ERRATA.

Page 8, line 12, *for* are *read* is.
29, last line, *omit* fallacy and.
51, first line, *read* in a drunkard.
104, *for* Chapter VII., *read* Chapter VIII.
120, line 25, *for* chope-damp, *read* choke-damp.

THE

MANUAL FOR INVALIDS.

CHAPTER I.

INTRODUCTORY.

Philosophical Opinions concerning Principles, in relation to Health and Disease.

It has been the wish of the writer of this Manual, in addition to the practical information it has been his endeavour to convey, to illustrate many of the allowed principles in the treatment of disease, and to afford the reason a just and proper guide in the attainment and preservation of health. Some minute and curious information shall be detailed respecting some of the more important functions of the animal economy, which, it is hoped, will enliven the subject, as well as increase its interest and utility. The ancient classic says, " Those will always carry their point, who unite the

useful with the agreeable; and, making all due allowance for the discrepancy of taste, utility will frequently attach so much value to a subject, as to throw all minor considerations into shadow." These preliminary remarks are considered not irrelevant to our subject; nor are they caused from any vain parade, with a view to forestall the good opinion of the reader: as the author does not flatter himself he shall be able to conciliate approbation from his manner or style, he must endeavour to attract the attention, and secure the judgment, by precision of ideas, in detailing fixed principles with useful facts.

The time will certainly arrive, when medical philosophy will form a very important part of general education; for the valuable truths relating to health and disease, are, in themselves, subjects of the most elevated interest and curiosity. In order to have a full knowledge of their various combinations, the study of many years is often insufficient; but of their immense value, and of their great practical importance, it is impossible to remain long in ignorance. In this, as in many other affairs of life, "sorrow will bring us to knowledge." Health and disease are considered by many as abstract terms, and have been invested with a sort of personifi-

cation. Instead of being viewed as varieties of existence, they have been considered as *things* in their very nature contradictory, and opposite to each other. Seldom are these states of feeling regarded as having any common connexion; still more seldom, as being the results of the same general laws, and consequences of the same principles of action. There are but few persons who have sufficient candour to acknowledge such mistake; but it is very easy to perceive, that a very great proportion of human beings, in other respects well informed, are, notwithstanding, governed through life by this error.

There is a certain peculiarity in the human constitution, called the predisposition to disease. All diseases have some exciting cause, acting upon a susceptibility variously modified; but this susceptibility is exceedingly different in persons; and this difference is not caused by the duration or quality of the exciting cause, but is doubtless occasioned by certain tendencies in the constitution of the party, either original or hereditary, or which may be produced by habits unfavourable in their effects upon health. In reasoning upon the principles which bear a relation to disease, after having noticed what is

termed the predisposition or susceptibility of becoming affected, the last movement of the healthy state, and the first of the morbid, claims some attention. This has been called the proximate cause. Much perplexity has arisen from misunderstanding the nature of the term: a *proximate* cause of disease may, perhaps, be defined as that symptom, or appearance, in the body or part most immediately preceding the state which we call the disease; and without which previous symptom, the disease would not be known to exist. For, according to all the rules of philosophy and truth, the creation of disease must depend upon the ratio of excitement and of susceptibility. It would seem, therefore, that a very important benefit would be conferred upon individuals, and upon invalids more especially, by diminishing the susceptibility to the stimulus, which produces that change of action denominated disease. A few observations upon this subject will not be uninteresting to the reader.

The *proximate* cause of disease has been just noticed; but there are other causes, which are termed *remote* causes; and if we were well acquainted with the train of causes which, in a regular series, succeed each other in the production of disease, we might probably establish

prophylactic medicine—the most valuable boon the Almighty in his wisdom and goodness could bestow upon mankind. Man is rendered liable to many diseases in civilized society, from which, in a state of rude or uncultivated life, he would be more or less exempt. One of the most productive causes of disease in society, is the morbid susceptibility which is engendered by almost all the habits of life: the constant effort of early existence, is to obtain, by all possible means, the gratification of every want, and the instant removal of every thing that causes pain, either to the body or mind.

We all know, that in civilized society, the wants of infancy and of childhood are satisfied as soon as they are expressed; they are even anticipated and prevented. A great mass of calamities are produced by our affections; they are the offspring of our passions, and very seldom under the controul of the understanding. It requires but little attention, in order to perceive that the *charlatanrie* of the usual modes of early education are productive of much moral evil. Under the present system of fashion and refinement, we are led to consider present indulgence as the most valuable purpose of our lives: we conclude, that the world was made for our pleasure; we are, of course, averse to the

trouble and effort of instruction; and, as a natural consequence, we cordially hate those who either oppose or contradict us: we view them as causes of irritation.

Every circumstance that creates a morbid susceptibility of body or mind, is a powerful productive cause of disease and misery; for it is well known, that to this very criminal indulgence of the innate propensities of childhood, may be traced not only the liability to disease, but also a positive insensibility to the sufferings of others: all love of country, or of kindred, is absorbed in sensual enjoyments and habits; but this is in some measure avenged by the morbid irritability thus accumulated—the certain foundation for the valetudinarian state, perhaps, for the remainder of life. Doctor Samuel Johnson has often said, that human life consists in a continued series of irritations; and that scarcely any earthly good is to be obtained, without labour and suffering. He likewise asserted, that no true pleasure could be enjoyed by any one, who had not experienced pain. It is also very probable, that every good is enhanced by the difficulty of attaining it. Many sufferings are alleviated by continuance or repetition; for moderate evils are not much regarded by those who have been habituated to greater: the principal

advantage of privation, is in diminishing morbid susceptibility to excitement, which is the fulcrum upon which most of the complaints of invalids move. These general facts show, beyond all dispute, the truth of the proposition—that the predisposition to most of the causes of disease, grow out of habits which are chiefly peculiar to the condition of civilized society. It would be very easy to accumulate instances, and to demonstrate them by evidence; but it would be no gratification to exhibit a detail of the prejudices, the weaknesses, or the vices of mankind.

In matters relating to health, nothing should be left to chance that can be governed by skill; though, in a strict and philosophical sense, there is no such thing as chance in the world. Our ignorance of the real cause of disease, or of the power of remedies, has the same influence on the understanding, and produces a like species of belief or opinion in watching the progress of fatal diseases, after all remedies have been laid by as useless. I have often been amazed at the perfect progression of the symptoms: no symptom usurps the place of another, either in the order of time or intensity. The process of disease is governed by organic laws; and to know them, is a research well worthy of our inquiry.

The more we know of all causation, the more uniform and constant shall we discover effects: and if rhubarb should, in any particular case, cease to act as an aperient, we shall be convinced it is still an aperient; but some cause, concealed from our view, has, in this instance, prevented its operation.

The generality of mankind never find any great difficulty in accounting for the causes of disease, or for the more common and familiar operations of nature. The descent of heavy bodies are said to be caused by their weight, in ignorance of the laws of gravitation: so with the growth of plants, the generation of animals, or the nutriment of the body by food, the first principles of which are concealed from the research of the philosopher: yet, from their common and every-day occurrence, they are considered as well understood. And all this occurs, and, indeed, much more, because we are utterly unable, from any principle of philosophy, to demonstrate a positive union of a cause with its effect. We cannot discover a necessary connexion between the last healthy action and the first movement of disease: the conjunction of the phenomena is what we are only permitted to witness. Why certain diseases should attack a person once only in life—small-pox, measles,

scarlatina, &c., is a circumstance that can never be explained by any of the now acknowledged laws of the animal economy. Yet these ideas are, from experience, so associated in our minds, that we allow them the full practical operation, without attempting to inquire farther; as the most elaborate research would afford no proof of any necessary connexion between the cause and the result, in this case, nor, indeed, in any other. Since the phenomena of disease is not the product of chance, but the necessary effect of certain prior causes, in full operation, the treatment of disease should also be rescued from the dominion of ignorance and chance; and be invested in the hands of men whose minds have, through life, been disciplined to the study of those symptoms and character of maladies. What is called skill in medical science, is nothing but a just comparison of morbid symptoms, with the power of the remedies to be employed. In carrying into effect the objects, or indications in view, a skilful practitioner in medicine may be compared to a skilful mariner or pilot, who, from often repeated observation, has a precise purport, and whose head and hand concur to carry that object into effect.

Although it has been ascertained that there is no discoverable link between the cause and

effect in the recondite phenomena of nature, the invariable and regular conjunction of them, in the order of succession, are as readily discovered in medicine as in metaphysics or philosophy. The author has no vanity about him, and his only anxiety upon this question is, lest he should have the misfortune to be misunderstood, and that the reader should conclude, that what he is unable to understand himself, was equally hidden from the writer.

When the causes of disease come into contact with a constitution whose susceptibility is favourable to its formation, a certain and invariable train of phenomena is called into action—there is a succession of symptoms in regular order and progression: an accurate observer, from experience, can easily foresee and foretell what symptoms are conjoined in this succession, and the method of their appearance; but whatever knowledge he may bring into operation, he never will be able to discover the necessary connexion, or uniting link, that one symptom has with another; but when long experience has convinced him, that certain symptoms have always been accompanied by other symptoms—by a law of association, as soon as he perceives one, he expects the other; nor does medicine, or pathological matters, appear to me to be

more unfortunate, in this particular, than either philosophy or metaphysics. When any species of event has always, without a single exception, been conjoined with another, we make no longer any scruple of foretelling the one upon the appearance of the other; nor do we hesitate to employ that reasoning, which can alone assure us of any matter of fact, or existence—we call the one object cause, the other effect: they are certainly connected in our imagination, but the connecting link can never be found, either in the symptoms of disease, or in the phenomena of metaphysics or philosophy.*

The pathology of disease is a science of as determinate a character as any of the recondite truths of metaphysics, or the more familiar facts of geometry; but it is not a science capable of being taught. By the intervention of language, men can generally be made thoroughly to understand each other in mathematical propositions; language and figures are quite adequate to explain numbers in arithmetic, and quantity in algebra; but language is very unequal to explain a great variety of very important facts in the pathology of disease: it may be acquired by long observation, and experience, but can

* Montaigne, an old French writer, avowed his conviction of this fact some centuries since.

be but very imperfectly taught through the medium of sounds. The view of the diseased countenance is a better index to the complaint, than any detail of symptoms which his language can convey. Now, take for example one pathological fact, viz. diseased structure; organic disease will in general occasion a less violent derangement of the system than the functional maladies of the same viscera. This is a fact known only by experience; all language and reasoning, what is commonly called *à priori*, would be conclusive on the other side of the question. From the less violence done to healthy action in organic disease, anterior to experience, we should naturally conclude that it would be more manageable, and easier relieved. Now the very contrary is the truth; for all affections of the structure itself are relieved with greater difficulty than affections of the function of the same organ. It may be observed, that the functions of a structure are very rarely disturbed without some degree of organic affection; and, on the other hand, that organic disease cannot perhaps long exist without the functions becoming in the end affected.* This is only true to a certain extent: it is

* Most acute diseases commence with functional disorder. Most chronic with diseased structure.

found, by experience, that an affection of the lungs, called catarrh, admits of a very early and important relief, however violent the symptoms may be, and the patient is as completely restored to health as if nothing had happened; but a tubercular consumption, which is an organic affection of the same viscus, although the cough may be moderate, and the symptoms mild, it will travel quietly on, and few maladies exist which are acknowledged to be equally fatal.

We may be easily convinced, that in our researches into the nature of things, our notions of power are very imperfect. In common language we say—this disease has power to destroy—these remedies have been found to possess the power to restore the patient to health. It appears to me, that it is the unknown circumstance of an object, by which the degree, or quantity, of its effect is fixed and determined, that we call its power; for instance, we are not equally able to move all the organs of the body, with equal power or facility; nor can any argument be adduced, except experience, for so great a variation between one and the other. We know, but only by experience, that the will has an influence over the tongue and the

fingers—not over the heart or the liver. We learn the influence of our will as we obtain a knowledge of disease—only by experience, which, in fact, alone teaches us how one event constantly follows another, without instructing us in the analysis of power, which is the uniting principle, and which, in fact, renders them inseparable. From anatomy we learn that the immediate object of power, in voluntary motion, is not the member itself which is moved, but certain muscles, and nerves, and perhaps something still more minute, and more unknown, through which the motion is successively propagated, before it reaches the member itself, and whose motion is the immediate object of the will. All these facts receive great illustration from the laws of chemistry with which we are at present acquainted. We have, therefore, great reason to assume as a truth, that the existence of power is nothing separate from the quality of the substance itself—that its effects are produced often to our cost; but the property called power is never seen. We assume its necessary connexion in producing the symptoms of disease, as we do the necessary connexion of cause and effect, which is also equally invisible; yet, to the critical observer, the

regular * conjunction of antecedent and consequent may be as easily known in pathology and medicine, as in philosophy and metaphysics.

* The various sympathies of different organs beautifully illustrate the truth of this position: indeed it would never be disputed, were an explanation of the phenomena at all possible.

CHAPTER II.

The Complaints of most Invalids referable to the State of the Brain, and Circulation of Blood therein.

THE first symptom which is manifested in most invalids who are not labouring under any acute disease, is a certain listlessness, an apathy, a species of wearisomeness, a discontented temper, impatience of contradiction, sleepless nights and toilsome days, false perceptions of things, inattention to the bowels, and frequently an obstinate costiveness, which is but very imperfectly relieved by purgative medicines, because it depends upon an inactive and disturbed function of the liver, the healthful action of which will keep the bowels in a comfortable state. It is certain that the symptoms and complaints of most invalids are, for the most part, very similar and uniform; indeed, making allowances for the particular temper, age, sex, and condition of individuals, no cause and effect, either in physics or morals, can follow with more invariability.

Now, I believe, in a very great proportion of cases, where there is no organic derangement of any viscus essential to life, that the primary cause of the first symptoms of most invalids is a disturbed function of the brain. The influence of this organ upon the function of the stomach and liver, is immediate and great: indeed it exerts wonderful power over the whole of the laws of the animal economy, and manifests itself in an almost infinite variety of ways. The brain will suffer a considerable deviation from its healthy action, before the party is even conscious of any change; especially as it is not unfrequently existing without local pain. In large capitals, especially commercial capitals, such as London, Glasgow, Dublin, Amsterdam, St. Petersburgh, Constantinople, and others, the great proportion of invalids are among those whose circumstances have been reduced by the casualties incident to mercantile life, and amongst individuals accustomed to the society of persons well educated, and whose habits and feelings are analogous to their condition. It is a very great mental infliction to be compelled to retire from such society, and to form a part with others whose feelings, habits, and sympathies are altogether alien to their own;

yet, in the various turns of the wheel of Fortune, this is very often the case. I have frequently seen individuals, such as I now describe, first seek solitude, grow silent and pensive, become captious, irritable, and ill-tempered: their mode of acting and thinking has undergone a change, and if hectic fever have supervened, the patient has become emaciated, and, at length, has died of what, in common language, may very properly be termed a broken heart;—yet there is no uncommon symptom observed to mark the course of the malady.

The power of the brain and nervous system upon the function of thought, as decisive of the character of individuals, must be admitted. In metaphorical language we often employ the head (meaning the brain) as the source of the operations of the intellect, and the heart as the source of the affections and sympathies. It is well known, that the internal organs, in proportion to their importance, as subservient to the purposes of health and life, are supplied with a greater or lesser quantity of blood. There is a much larger proportion of blood sent to the head in the human subject, than is necessary for the nourishment of that part. The brain, even for the healthy exertion of its function, requires

a very large supply of blood. There is a much greater quantity of blood sent to the head of an individual whose mind is much exercised, than passes into the head of a person whose mind is in a state of inactivity or idiotism. The first thing that strikes the attention of anatomists, in the act of contemplating the head and the functions of the brain, is the very large quantity of blood destined to this part, when held in comparison with other parts of the body. A calculation has been made, that one-third of all the blood in the body is sent to the head: this may be overrated, but accuracy of proportion is by no means necessary to the establishment of the principle. We believe we may fairly say, that the circulation of blood through the head, as compared with the other parts of the body, may be in a ratio, as one to four, or between four and five. Now we should naturally expect, from the nearness of the head to the heart, that the circulation through this part should also be proportionably rapid—so very delusive are first considerations. Now, on the contrary, we find it remarkably slow—a principle which nature adheres to in some other very important functions of the animal economy, and especially where a secretion, upon which the future chance of offspring in the human species may depend.

The causes of the slow circulation of blood in the vessels of the head are various. Firstly, the situation of the head itself, by which the blood has to ascend in direct opposition to its gravity; secondly, the acuteness of the angles at which the vessels supplying the head turn off; and we find both orders of vessels making various convolutions. Added to this, both the internal carotid, and the vertebral arteries or blood-vessels, appear, on entering the cranium, to lose, in a great measure, their arterial character, which is elasticity, and power of pressing the blood: they have now so little of the muscular and elastic coats, so very essential to an artery, that it is with the greatest difficulty we can distinguish the artery from the vein.

The reason why I am thus minute in giving a description of the distribution of blood to the head, is because I am convinced that from this source most of the symptoms which invalids feel, arise. The particular economy of the brain seems to require that the circulation here should be slow; for, to what purpose do we suppose this quantity of blood is sent to the head? Certainly for the nourishment of the brain, and to enable it to perform its functions. As, therefore, the actions of the brain are of great importance, whether we consider the brain as the seat of

reason, or merely as the origin of nervous energy to be distributed to the various organs of the body, it evidently follows that a very elaborate process, and a very considerable length of time, are necessary to separate the proper elements from the blood. From the most accurate observations it does not appear that much red blood is circulating through the substance of the brain: it therefore should seem that the more watery parts of the blood are those parts which place the brain in such a state as to enable it to receive impressions, and to perform the function of thought.

The nerves, whose origin is from the brain, are the organs of sensation and sympathy. Now, as perverted sensations, or disturbed perceptions, are the cause of a variety of maladies under which the invalid suffers, we must inquire what is the nature of sensation.

Sensation is an impression produced on the mind by some cause acting on the body, which the mind instantly refers to the part where the cause is applied; but that it is not always correct in such reference, many examples might be given. Sensations are of various kinds; indeed, so various, that it is doubtful whether or not language itself could define them. They are as various as the tints of colours: they may, however, be divided into two distinct classes, viz.

agreeable and disagreeable; though, in reality, this distinction appears almost superfluous; as there are very different effects produced by the same cause acting in a different manner—for pain is nothing more nor less than our common sensations carried to excess. By different modes our sensations inform us of different circumstances, as different organs are by nature fitted for particular sensations—as the mouth for taste, the eye for light, the ear for sound, &c. Besides, there is a certain disposition of parts necessary for the reception of particular impressions. All our sensations are much more acute in the early time of life than at other periods: indeed, it is often one of the characteristics of age to lose in part the senses of seeing and hearing; which seems to arise from some partial paralysis of the nerves in the direction of those particular organs. There is a direct and an immediate influence upon the heart and circulation from the passions of the mind. Thus a variety of persons have felt palpitations when placed in particular situations; and this solely arises from the sympathy of the nervous system.

Having thus shown in what manner the brain, and whole nervous system, is affected by external agents, we can the less wonder that all the functions dependent upon that influence should

become disturbed and disordered, when adversity, and all its attendant sorrows, attacks the sufferer with an overwhelming force, blackening every cheering prospect, to the extinction even of hope. We are not all endowed with the same resolution, or the same powers of bearing up against calamity; for that which may be said to be but a trifle to one person, will prove an intolerable torment to another; and what one, by his singular moderation, and well-composed carriage, can easily overcome, another is not able to sustain, but is compelled to yield to the circumstances of his condition: then his complexion changes, his digestion is impaired, his sleep is gone, his cheerfulness is banished, his spirits are low, and his heart is heavy—the whole character sustains a change, and every feeling becomes gloomy and melancholy.

More or less of these feelings and symptoms are constantly observed to exist, for the most part, in all invalids where the disturbed function of the brain may be traced as the source of the varied phenomena—no doubt modified by the original temperament, and peculiar character and habits of each individual. Our temporal happiness consists in attaining that state and mode of life which our respective genius or inclination urges us to wish or to desire. Com-

forts, with respect to the feelings, may be compared to clothes with respect to the body; it not being possible to bring those which in appearance are best made, to suit well with, or to fit, every shape. Some flexible tempers can accommodate themselves to every kind of fortune, and be content to live within the limits of its extension. Some waxen dispositions, at will, are enabled to accommodate themselves in such a conciliating manner, that every thing seems to sit easy on them: nothing disturbs them, because the softness of their nature gives way to every impression—they rise without fatigue, and they descend in society without violence. They are of so particular a frame of mind, that, provided they do not feel the want of the common necessaries of life, they seem equally content in every station. Those whom I have now described seldom become invalids from a disturbed function, but they are perhaps even more liable to organic affections, on account of the inactivity which is engendered by a state of things common with those who, having every wish accomplished, have, at least, but little to desire, if they have much to enjoy.

But let us reverse this picture, and trace the causes which have probably brought our invalid to the necessity of reading this Manual. Our

principal research must be to detail the symptoms and effects of unhappiness and misery. With those whose unfortunate destiny has drawn them into the events of life which are at constant war with their genius and inclination, the violence done to that inclination is constant, and therefore their disgust is constant also; that which in its nature is sweet to others, is to them very bitter. It would seem to us a wise dispensation of Providence, that every human being were placed in such a state of external circumstances as would harmonize and dovetail with the internal feelings and temper. But the world is certainly governed in a different manner. Some are rendered truly miserable by the events of fortune, but there are others (and those are not a few) who are so by nature—those, I mean, who, in their own proper genius, temper, and disposition, find their greatest enemy—discontented persons, who are pleased with nothing, but are always loathing what they are in possession of—who never can be comfortable, and who increase their own misery by being envious of those who are so. When adversity, and the calamities of life, assail dispositions of this sort, it must have most decided power over the seat of the intellect, and will produce not only an aberration of

mind, but those bodily disorders which are of the most deplorable nature, as a natural consequence. To relieve such is one of the purposes of this Manual.

CHAPTER III.

Digression, concerning the Nature and Extent of Human Knowledge—Our Experience of the Nature of Disease, and the Power of Remedies, obtained by observation of the invariable succession of Symptoms.

This digression seems naturally to arise from the matters we have been previously discussing; for there cannot be a finer or more interesting subject for the exertion of our knowledge, than the principles of life and of death. In all the efforts of our understanding, one very curious and important fact is developed—that every phenomenon, both of matter and of mind, is governed by certain and invariable laws; and that those principles which govern phenomena are, to a certain extent, capable of being known and ascertained by human inquiry. This is the only real foundation of human knowledge; observing the order of succession by which one event succeeds another. It is this which forms a datum, upon which all reasoning, concerning matter of fact or identity, can be established. All

prognostications, arising out of symptoms, having heretofore been invariable in their succession, enables the skilful practitioner to foresee, and to foretell, nearly with certainty, the result of the phenomena of disease. Yet it has been observed, that men are often more anxious to find out the reason of a thing, than to find out the truth of it: they slide over suppositions, but very nicely examine consequences: they leave the visible and tangible things, and fly to anatomise causes. The various theories of physiology are most abundantly illustrative of this truth. In a general way, some will say that the knowledge of causes most concerns that being who has the conduct of them. We are compelled to yield an obedience to effects, without the capacity to understand the original principle or essence. Partial knowledge is worse than positive ignorance, because it is mixed up with the opinion of learning. Effects greatly concern us, often, when causes put our researches to scorn. It has been said, by a very learned and acute critic, that we are all as ignorant of first principles as we were in our cradles. It would certainly appear just, to suppose, that the philosophy which regards the phenomena or appearances of things, as they take place in certain and invariable order, is the philosophy of every thing that exists in

the universe; for upon what other principles can our knowledge or experience be grounded? We see that every thing around us is the subject of unceasing change; yet appearances do not carry exactly the same aspect to all men: error assumes the appearance of the truth, and truth is sometimes so mixed with concurring events, as to make it appear in the garb of error. I have often been convinced of this position, in reading the beautiful thoughts of Cicero, whose vanity often subdued his attachment to truth: the great Cicero was not ashamed of a lie, and purely from motives of vanity. This frailty seemed quite congenial to his being: he wishes his friend to write the history of Rome, and to begin it with an account of his suppression of the conspiracy of Catiline; and then to give a retrospective narrative of events, to the time of Romulus: and in every thing in which he was concerned, regarding the transactions of his own times, he implored the historian, that the strict rules of truth should be exceeded, so as to give a brilliancy and lustre to his counsels and actions. Thus errors in philosophy and science are liable to the same casualties as the falsehoods of private life, and against which we cannot be too solicitous to guard ourselves; for it would seem to me, that fallacy and falsehood has an equal

tendency with truth, to propagate itself, notwithstanding the famous proverb, which says—*Magna est veritas, et prevalebit.* Error rears a fabric; each party contributes a little, like patchwork; so that the remotest witness declares he knows more than the nearest, and the last informed is always more certain than the first. Thus it proceeds, in a very natural progress; for whoever believes anything, instead of inquiring if it be true, thinks it a much greater work of charity to reduce others to the same opinion. We are conscious of perpetual change; but often vain is the attempt to comprehend either causes or consequences. We are not allowed to penetrate into the mysteries of the divine Mover; yet, with a presumption truly wonderful, we often ascribe good health and good fortune to our discretion and prudence. But when the consequences of our folly and ignorance overtake us, we solace ourselves with the thought, that "whom the Lord loveth he chasteneth." Human knowledge could never yet arrive at the duties it could prescribe to itself; and, indeed, were it possible to reach this mark, it would immediately prescribe to itself others beyond it—so great an enemy to consistency is our human condition. The ancient philosophers have prated for ages about the dead and motionless

masses of matter—the *vis inertia;* which philosophy, in company with many other things, then believed as immutable truth, hath passed away. We now know that the world itself is one mighty system of change: all things, unorganised matter, as much as the organised, are the subjects and exhibiters of unceasing variety. What seems to our eyes to be rest, is continued motion; and, what is truly astonishing, there is not a particle of the planet on which we dwell, that continues in the same point of space, even during the instant in which we strive the most rapidly to think of it. Life and death may be said to be a dissolution alike, or, more properly, in the same space of time. There is a more varied decomposition while we live, than when we die. Now, in the whole internal world, although the phenomena are of a different order, there is a variation of them as perpetual; and if the bodily functions of life continue only, the particles of the frame are quitting one place to exist in another. The functions of the intellect, which animates it, may be said to subsist only by the succession of feeling after feeling. The basis of all science, of all experience, is founded upon the great character of all these changes, and the regularity which they are known to exhibit:

which regularity enables human beings to accommodate their plans with perfect foresight to circumstances which may not yet have begun to exist. The observation of the variable phenomena, as they are continually taking place around us, and within us, appears to be that of a moment, or point of time; but the knowledge which it affords, is far more extensive: it is truly, and virtually, information of the past and of the future, as well as of the present. For the future, when it arrives, we find it to be only the past, under another resemblance: thus the whole universe is but one perpetual motion, in which all things are incessantly rolling. The rocks of Caucasus, the pyramids of Egypt, both, by the general motion of the earth, as well as by a particular inherent one of their own, are always in action. Even constancy itself may be said to be a mere steady or languid motion. We must take our feelings at a point of time—just at the moment when we consider it,—the next moment revolutionizes us. Either we are not exactly the same beings, or we are subject to other influences; or we lay hold on subjects with other circumstances, considerations, and feelings. It is this perpetual vacillation that makes us appear so very inconsistent with ourselves, even upon the subject of know-

ledge and experience; for the man of learning is not learned in every thing; but the presumptuous man is self-sufficient in every thing, even in his ignorance. At every moment of our consciousness some sensation, or thought, or emotion, is beginning in the mind, or ceasing, or growing more or less intense. Thus the changes which we know in the actual circumstances observed, we believe to have taken place as often as the circumstances before were similar; and we believe also, that it will continue to take place, as often as future circumstances shall in this respect have a true resemblance to the present. Nor are we ever deceived; for what we thus believe, is always verified by subsequent observation. Thus do we truly obtain a prospective knowledge of the future, while we may seem to be only observing what is before us, or remembering what has been formerly observed; and in whatever way this prophetic gift may have been conferred upon us, it must be regarded as the most valuable of all gifts, since, without it, every other gift would have been of no use. It has been constantly observed, that the world is not a resting-place of a moment; it is the restless home of myriads of generations, for the many long years of their mortal life; and for the purposes of that life it is most wonderfully

fitted with whatever is necessary either for sustenance or for shelter—for the prevention of pain, and the enjoyment of pleasure: it is also well fitted for the exercise of those talents with which the Almighty has thought proper to endow us. Uneasiness determines the will to avoid the causes of uneasiness in future; this leads to a critical examination of what are the causes, &c. The knowledge of the invariability of similar sequences or effects to the priority of certain antecedents, or causes, is essential not to science only, but to all the practical arts of life, and, of course, to the preservation of life itself; we rest upon it with a moral certainty nearly equal to the laws of physical matter. In whatever manner it may arise, and whatever circumstances may or may not be necessary for giving birth to it, the belief itself is a fact in the human mind which cannot be denied, and a fact as universal as the life which depends upon it.

What do we mean by saying such a person is very skilful, or a person of very great experience? Why our meaning is, that such a person has applied all his powers of attention to the succession of events, and constantly observed the regular order of sequences; we can have no other idea of power or causation, to whatever objects,

either spiritual or material, the words may be applied. Now if events had succeeded each other in perfect irregularity, such terms never could have been invented; but when the successions are believed to be in regular order, the importance of this regularity to all our wishes, and plans, and actions, has of course led to the employment of terms significant of the most valuable distinctions which we are physically able to make. We always give the name of cause to the object which we believe to be the invariable antecedent of a particular change; and we give the name of effect reciprocally to that invariable consequent. This is all that constitutes either knowledge, science, power, or experience, or by whatever other name we think proper to give to those abstractions which we frequently personify. The late Mr. Fox said he entertained very great doubts respecting the accuracy of all abstract reasoning whatever, from which matter of fact, as a guide of conduct in life, could be deduced. He was well aware of the great inconvenience of all abstract terms; for when they become very familiar, we are very apt to forget that they are abstractions, and to regard them as significant of some actual reality. The history of the errors, not of the unreflecting multitude only, but of philosophers

themselves, is, in a great measure, the history of this very species of error, modified and diversified in a variety of forms of prejudice and superstition. We perceive the regularity of phenomena in the planetary system, in the processes of chemistry, and indeed in every part of the physical world; but we hesitate to apply the same simple principle to the feelings of the mind, or the phenomena of the moral world. Yet the Divine Author of nature has not multiplied causes without necessity, but has given us perfect freedom to act in obedience to our will. The will he has decided should yield obedience to laws which he has created; for there is no created mind capable of beginning spontaneously a series of changes, more than any mass of created matter. All is only a continuance of changes, and often of mutual changes. The changes produced by mind in matter are indeed more obvious to the perception of others, and more directly measurable, than the changes produced by matter on mind; but it is the simple production of a change, not the nature of the change produced, which is essential to the argument; and of the ever-varying phenomena of the material universe, there is truly as little cessation, as of those which are most rapidly successive in mind: even the apparent

rest of matter, it must be remembered, is a sort of action rather than repose. John Toland created to himself many enemies for promulgating this simple truth, now so generally admitted: he asserted that all human knowledge, and what is called skill, or experience, in men, have their foundation in an accurate attention to the invariable succession of antecedent and consequent, and that in reality there were no strictly moral causes; but all events were practically and virtually physical.

CHAPTER IV.

The Occupation of the Mind—The Attention should be directed to Objects of Usefulness, as tending to prevent Languor and Fastidiousness—The Love of Literature and the Fine Arts—The Cultivation of a correct Taste, &c.

It is so very essential to the due performance of all the animal and mental functions, that the mind should have well-defined objects to pursue, that Gualter declares the mind can never rest, but is constantly meditating on one thing or another; and except it be occupied about some laudable pursuit, it is sure to produce a disturbed function of the brain, and is causing miseries of every description; thus idleness, or apathy, or indolence, or want of intellectual action, is a paralysis of both health and energy. As fern grows in untilled ground, and all manner of weeds are found to fructify, so do every unhappy feeling become an inmate of an idle mind. The horse that has never travelled—

the hawk in the mew, that seldom flies,—are both subject to diseases, both of which, in a state of nature, would be free from such maladies. Inactivity or idleness of the mind has worse consequences than that of the body. Seneca settles the question, by declaring *ærugo animi—rubigo angenii;* thus evil and corrupt thoughts are constantly arising in an idle person. For what will not both fear and fancy work in an idle body? what disturbed functions of the organs, most essential to cheerfulness and peace, will they not produce? Those who know not how to spend their time, have much more business, more care, grief, and anguish of mind, than those whose powers of body and mind are in healthful exercise. An idle person knows not when he is well, nor what he would have. The want of healthful excitement has stimulated often to gambling—the beaten road to a violent death. The motto *Otiosus animus nescit quid volet*, is grounded in nature and truth. The idle party knows not what to will; he quietly waits for sensations, till every perception is changed in its character, and a listless *tedium vitæ* succeeds every impression: he is tired out with every thing, displeased with all, and weary of his life—happy neither at home nor abroad.

Seneca says, *Præstat aliud agere quam*

nihil. The Egyptians of old, and many of the more ancient commonwealths, enjoined labour, both of body and mind, to all their subjects, and compelled them to give an account of their time, to prevent the mischiefs that were found to arise from listlessness: the active power of doing, and the negative power of suffering, were found to be greatly increased by exercise. Every human being, in every station of life, either rich or poor, should have a definite, determinate pursuit. The very word pastime seems a reproach, as if we were born for no other purpose or end but to drive time away as fast as we can. To correct, or avoid all these evils, our learned divines and physicians, nay, also our politicians, have, much to their credit, greatly urged us to cultivate our energies in entertaining and useful employment. The man of the world cannot easily obtain riches without labour and toil; nor can the elegant scholar obtain learning without study and great mental exertion; neither can our health be preserved without bodily exercise. The celebrated physician Areteus writes, *De ambulatio per amœna loca*, and advises those people who have the means to take pleasant journies to so amuse themselves; but the most desirable, as well as the most delightful, of all exertions, are

undoubtedly mental. Is it possible for any person, who is not wholly subdued with idleness, or involved in a vortex of worldly cares, that will not find his mind greatly relieved, as well as instructed, by the perusal of some useful and entertaining author? Biography alone is a most delightful study, wherein we may observe, as it were in a glass, what our ancestors have done, in the most critical situations; the beginnings, progressions, fall, and ruin of nations, as well as private men's actions displayed to the life; the secret springs from which the most important actions have arisen are herein detailed. Julian, commonly called the Apostate, was so enraptured with an oration of Libanius the sophist, that he declared it was impossible for him to rest until he had read it throughout. And we may say nearly the same of any amusing or intellectual work that has sufficient interest to arrest the attention, and carry it along with it. To most literary men it is an extraordinary pleasure to study: the labour is lost in the enthusiasm. Progression in learning is not to be purchased with money. "There is no royal road to learning," any more than there is to happiness. What an almost infinite variety of good books offer themselves, upon almost every subject, art, or science—

arithmetic, geometry, astronomy, perspective, optics, and, although last, not least, pathology and therapeutics! This most delightful study has boundless resources for the occupation of the mind, and would repay, with most usurious interest, all the fund of attention expended upon it. What numberless volumes have been published, having for object to scatter knowledge in law, physic, and divinity—for pecuniary profit some, others for pleasure and speculation! It is curious to observe what trifling analogy exists between the law of nations and the law of nature; how local courts and jurisdictions are occasionally at war with the first principles of justice. We have thousands of authors upon these subjects; their very names would fill many volumes: many great and noble libraries, well furnished; and he must have a very imperfect and improper taste, who relishes none of them. Some take a very great delight in studying even the languages in which those books are written. The study of natural history is a beautiful occupation of the mind—to peruse the account of birds, beasts, insects, fishes, and reptiles. The class of serpents, their beauty, their variety, associated with the fact of their bite being mortal, fills the mind with astonishment. Plutarch says, "What more pleasant

study than the mathematics? Such are the excellencies of the sestudies, that all the ornaments and childish bubbles of wealth, are not worthy to be compared to them." Leonard Diggs, an English mathematician, wrote a work entitled "Prognostication Everlasting, or Rules to judge of the Weather;" in which he says, *Crede mihi extingui dulce erit mathematicarum artium studio:* he says he could live and die in such meditations, and take more delight in them than others do in the midst of their wealth.

Similar pleasures may be created by any rational study or mental occupation; it only requires the predisposition to the pursuit: it would prove like Circe's cup, and would engross every feeling; the whole man would be absorbed, as was Julius Scaliger, who was so affected by poetry, that he declared he would rather be the author of twelve verses in Lucan, or of the ninth Ode of the third Book of Horace, than to be the Emperor of Germany. Seneca carried his enthusiasm to such a pitch, that he declared his preference of Zeno and Chysippus (two men celebrated as stoics), before any prince or any general of an army. What must have been the sensations of Orontius, the mathematician, who, in his admiration of Archimedes,

calls him *Divinum et homine majorem;* and certainly such enthusiasm, in this instance, can scarcely be said to be ill-placed. Thus, we see that exercise of the body tends to preserve health; and exercise of the mind will give energy to the character, and develope everything that is sublime and noble in man. So entertaining and pleasant is the pursuit of study, that the more learning we obtain, the more we desire to have, and the last day is *prioris discipulus*—it is hard at the threshold, but pleasant as you advance; the root is bitter, but the fruit is sweet; and we have many instances on record of men who have attained their century of years, retaining their intellectual faculties, and admiring mental acquirements with the avidity of youth: the longer they have lived, the more have they been in love with the Muses: yet it has become fashionable with those who are born to riches, to hold in contempt learning and libraries, while they venerate many other matters of great expense and of small utility, and this entirely through error, ignorance, and want of a proper education. The acquirement of knowledge, by means of the expansion of the intellectual faculties, has many and very great advantages; it enables us to attach a just value to proper objects of

pursuit, to place all objects in their relative position, as it regards the public in general, and the individual in particular; a just estimate is by these means obtained between the bodily and the mental exercises. An excess of bodily exercise is frequently checked by the indolence inherent to our nature, or the repetition prevented by the lassitude and fatigue which it engenders; but the seductive nature of intellectual exertion requires the judgment to guide and regulate those amateur feelings; for, like everything else, when employed overmuch, its evils are severe—loss of the powers of digestion, depression, dejection, general weakness of the whole nervous system, atrophy, and, in some instances, from the mind being overcharged with a multitude of ideas, insanity has supervened, to usher in a premature death.

There can be little doubt but great allowances must be made for the vast difference of structure and constitution of various persons. Some people have naturally a powerful and active organization, both corporeal and mental; of course, such will suffer less from exertion than others who are destitute of those advantages. It must follow, that those are most affected who, with an ordinary structure of mind, use endeavours to force it beyond its powers: and

it is well known that excessive mental exertion, which we make involuntary, and which produces no pleasure, is certain to weaken us most. Every irregular action of our powers is hurtful; and we find that exertion of mind, without attention to bodily exercise, is greatly more prejudical than when united with a proportionate action of the muscles. Thus we discover their mutual dependence upon each other.

The learned Boërhaave informs us, that after having bestowed intense study for a few days and nights on one object, he fell suddenly into such a state of lassitude, that he lay for some time in an insensible and death-like condition. Therefore the same law appears to prevail here, as in regard to muscular motion, and ordains that we cannot think too closely or incessantly upon the same subject: a proper change of objects is essential to the due occupation of the mind, in order to study without injury to the health. There are many abstract thinkers, such as are metaphysicians, mathematicians, and philosophers, who, at a very advanced stage of life, are very happy and content, by observing this variety as a law or rule of conduct, taking care to divide their time between abstract studies and the reading of history,

agreeable poetry, travels, and the works of natural history. It is worthy of remark, that when a person employs the intellect upon the abstract and very difficult points of philosophical subjects—such, for example, as the higher mathematics and metaphysics,—the object makes a great difference the more abstract it is, and the more it obliges the party to disengage himself from the sensual world, and, as it were, to insulate the mind from the body. Now this is a most unnatural state; it is a condition of convulsion, inducing very great difficulty. A little time employed in such abstraction produces as great a lassitude of the mind as large bleedings produce in the body; but here a great deal is relative. There are many people who seem born for intellectual labour, and are endowed with those powers and that frame of mind which its developement requires. It may seem singular, that when it is requisite to raise up a weighty substance, we always first try our strength to learn whether it be not too heavy for us; but in regard to a mental burthen, we never suspect our powers, or imagine we are unable to accomplish the task. We must not penetrate the depths of philosophy, unless we have heads well organized for philosophical pursuits; at all events, objects of simple utility

should be chosen, instead of subjects of ornament or of curiosity. Gratification of amateur or virtuosi feelings, will be very dearly purchased at the expense of health of the body and peace of the mind. The creative labours of the mind are, by far, more exhausting than the recipient or passive state, enjoying foreign ideas; as, for example, reading, or hearing of others read, requires but little effort compared with the productive quality of giving birth to original thoughts. The writings of many of the Roman philologers seem to point out more to the perusal of good writers than any other pursuit. They were so naturally prone to gymnastics and the ardour of military glory, that they certainly stood in no need to be stimulated to bodily exertion;—they always lean to the exertion of the intellectual faculties. Seneca, when an old man, said, "If you be very fond of books, you will have it in your power to escape much of the *tedium vitæ*, or *ennui*, of life; you will not sigh for the evening, nor feel disgusted with the occupations of the day; nor will you live dissatisfied with yourself, or unprofitable to others."—(See his writings, *De Tranquillitate.*)

The whole writings of Cicero have given us continual recommendations to the study of the

fine arts and the pursuit of polite literature. His Tusculan Disputations, his *De Finibus*, and the Academical Questions, more especially, abound with the finest thoughts, embodied in the most elegantly classical language, to the same purpose, and particularly in his *Oration pro Archiâ*. He there lays it down as a law of nature, that study is the food of youth, and the amusement of old age. The younger Pliny, also, the friend and social companion as well as adviser of the Emperor Trajan, roundly asserts the following words:—"I am quite transported and comforted in the midst of my books: they give a zest to the happiest, and assuage the anguish of the bitterest, moments of existence. Therefore, whether distracted by the cares or the losses of my family or my friends, I fly to my library as the only refuge in distress; and it is here that I learn to bear adversity with fortitude."—(The Eighth Epistle, chap. xix.) Thus, we perceive it is a matter of great importance in the occupation of the mental power, to have resources within ourselves: for it is very certain that those who have no internal resources of happiness will find themselves uneasy in almost every stage of life; they will derive no accession to their comfort from the activity or the hilarity of youth, nor will they be able to

draw peace from the gravity and experience of age; but to those who are in the habit of deriving the greater part of their felicity from within themselves, no state will certainly appear a real evil, into which they are conducted by the common and regular course of nature. Yet such is the inconsistency of human folly, that a lengthened possession of life, which it is every man's warmest wish to attain, no sooner appears in consummation than it is immediately the object of lamentation and grief; but if we be deceived by our false calculations, must not the blame rest wholly on ourselves? for the years that are elapsed, how numerous soever they may have been, can by no means console a weak and a frivolous mind, under the usual consequences of long life; for unregulated passions, and a froward disposition, with a petulance in temper and in manner, will embitter every season of our existence. A classical writer gives it as his opinion, that the human mind is more impaired by suffering its powers to lie dormant and unexerted, in a slothful and spiritless state, than by the natural effect of the progression of time. The pursuit of literature, and cultivating a taste for the fine arts, has a peculiar good effect in destroying a predilection for all fastidious proceedings. You

seldom see a love for literature, a drunkard or a debauchee. Wine, and the irregular pursuit of sexual enjoyment, has infatuated and ruined myriads of people. Persius, in his Fifth Satire, says,

> " Qui Vino indulget, quemque alea decoquit, ille
> In venerem putris ;"

and it certainly is no small privilege to be exempted from the tyranny of such violent passions. " To whom is sorrow (saith Solomon), to whom is woe, but to such a one as loves drink ?" The immoderate love of drink causes poverty and want, shame and disgrace. With respect to the other passion, the love of the sex, it is founded in nature ; and when cemented with virtue and honour, and a conformity of temper, tastes, and interests, is the most delightful enjoyment we are capable of receiving : but its irregular and vicious gratification is not only a monstrous crime, but by its effects inflicts the most extensive misery upon both sexes.

Menander says, *Atque homini cerebrum minuet*, in its consequences ; wounds are received, inflicted as by a two-edged sword : the drunkard and the meretrix God will judge. They lose both grace and glory ; *amittunt gratiam, perdunt gloriam*, are the words of

Austin. They are likewise deprived of health and longevity, which frequently accompany each other. Cicero particularly advises us to preserve with great care our intellectual powers, as being even of more consequence than those of the body; for the powers of the body, like the flame in the lamp, will become languid and extinct by time, if not duly and regularly recruited; but there is this difference between them: bodily exertion will end in fatigue, whereas the mind is never wearied by its activity, if the study be analogous to the temper and the feelings of the party. There certainly is nothing more opposed to the energy or the perfection of the human character, than a slothful and spiritless life. The fact is clearly this: the irregular indulgences of the amorous passions, although a vice to which youth is very generally prone, is a vice with which only those young men are infected, who are unrestrained by principles of virtue, by a verisimilitude to that species of delirium or dotage to which some old men are incident; yet it is not observable in all, but only in those who have trifled away their time in frivolous pursuits of idleness and of folly. By directing our thoughts to objects of usefulness, we not only prevent languor, but we receive great inward satisfaction from the

retrospect of such conduct. Whatever represses inordinate and irregular desire, teaches us to retire within ourselves, and look for happiness in our own bosoms. This is no small moral benefit; it is the sweet food of the mind, and which can only be gathered in the fields of science.

In vain are the gay amusements of the theatre, the splendid display of a luxurious table, or the violence of irregular sexual enjoyments, compared to the calm delights of intellectual pleasure, which, in a mind properly formed and sedulously cultivated, improve much by time, and gather strength with years. The great Solon declared that he learnt something useful to himself and others every day that he lived: it was a declaration much to his honour; for no person can dispute, that to be continually advancing in the path of knowledge is one of the most pleasing satisfactions of the human mind. I have said that we should cultivate a love of literature and the fine arts, and endeavour to possess and to improve a correct, chaste taste. For this purpose I am persuaded that rural and picturesque scenery is very favourable. The pleasures of rural nature are consistent with every period of our lives, and they certainly approach the nearest of all others to those of the purely philosophical kind. What possibly

can be more delightful, than the very beautiful varieties to be observed in natural history—the properties of the earth, with its abundant fertility, which it readily yields to the cultivator's industry, and returns with interest whatever he deposits in her keeping? How wonderful are the phenomena of nature! A philosophic mind, devoted to the cultivation of the earth, must develope new sources of gratification continually: agriculture, to a mind charged with a love of philosophy, is a noble study. I have very often been delighted with observing the power, and tracing the process, of nature, in her vegetable productions.

Now, after our taste has been improved by the contemplation of the sublime and beautiful in nature, we feel a pleasure in works of art, and the embellishments of life. It is thus that the works of imagination bestow a source of pleasure and delight upon objects which, to a mind thus improved, appear as a new creation. It would also seem that our pleasures have, in a well-informed mind, an analogy with our respective periods of life: even the difference of sex forms a variety in the pleasure of particular habitudes and pursuits. Infancy and youth, manhood and old age, greatly differ; yet we do not find that youth regrets the toys of the

child, or manhood lament that it has no longer the amusements of youth. An unceasing activity of body and of mind, bearing a just relation to its powers, seems to be an evident purpose of nature, in reference to human beings, and appears to be intended by Providence to preserve our health, and to continue our gratifications of a mental character, to the latest period of our lives. Therefore it is most desirable that we should encourage an enthusiasm for the fine arts and the picturesque of nature, that it may settle into a permanent habit; for what is effected by habit, is accomplished without any effort or constraint.

An elegant writer observes—"And what, if men of genius, relinquishing their habits, could do this violence to their nature; should not we lose the original for a factitious genius, and spoil one race without improving the other?" If nature, and habit—that second nature which prevails even over the first, have created two beings distinctly different, what mode of existence shall ever assimilate them? Antipathies and sympathies, those still occult causes, however concealed, will break out on various occasions, either sooner or later. Another unfortunate effect of the power of habit is, that all persons surrounding and having frequent

social intercourse with men of great talents, or original minds, are not able to appreciate the grasp of thought familiar to them; for the personal society of ordinary minds with men of great mental powers, often produces a most ludicrous prejudice. A Scotchman, to whom the name of Dr. Robertson had often been repeated, was very anxious to know who he was: when informed that it was his neighbour, he could not easily persuade himself that the man he had so frequently conversed with was the celebrated historian of his country.

It is my anxious wish to render this Manual as extensively useful, as the subject-matter of health is most deeply interesting. I may not always amuse, from the abstract nature of some of my observations, and the desultory manner which I have chosen to communicate information; but I hope always to profit the reader, from the useful facts which are herein recorded.

Helvetius says, that the whole of man is sensation; that events, and the impression they produce upon the irritable organization of the nerves, constitute the temperament and character of the individual. In the temperament of talent, may we not discover certain indications, or prognostics, announcing the permanent character? It has become a question, whether or

not great sensibility be not inseparable from a highly susceptible organization. The modest, retired character will adhere to its obscurity, while the unalterable being of intrepidity and fortitude will be full of courage and resolution. We can readily perceive, in the human countenance, the developement of the mental character; whether such delineation be the result of the operation of causes which form the function of thought, produce those lineaments, and give determination and character to the expression of the muscles of the face, or not, I will leave the reader to determine: but we are not very long in discovering whatever of character is either amiable or interesting in the quality of the human mind That such expressions exist, or that the human form is actually significant to us of mental qualities, and, as such, is productive of the emotions which such qualities in themselves produce, is proved, beyond dispute, by the universal language of mankind. We speak of the form of the human face, as majestic, heroic, gentle, benevolent, determined, melancholy, or despondent; but what is much more, they are the only terms in which, in infant languages, or among the common people, the human form is described and distinguished. The progression of art gives to the artist the advantage of

technical terms; but in every country, the great body of the people adhere to their first impressions, and distinguish the individual qualities of mind of which they feel them to be significant.

It cannot be for a moment doubted that the possession of health is necessary to the perfect developement of courage and mental powers; yet I can conceive a very extensive combination of thought and great mental determination to co-exist in a body but delicately formed and easily disturbed in its functions. A well-informed mind upon the principles of health and disease, by a knowledge of the causes and the effects of maladies, will be certain to acquire considerable power over events: knowledge gives power and resolution also. An ignorant or irresolute man is incapable of acting up to a firm purpose; he often thinks what a determined course he could have pursued, if his talents, his health, and age, had been different to what they are; everything must be moulded to his purpose, or he can do nothing of himself; he must implicitly follow the current of events; he uses no effort to stem or command them: perpetually querulous, and almost continually murmuring, he fritters away in useless complaint those energies which a very different

conduct would have enabled him, with a vigilant eye, to have seen, and with a strong hand to have grasped, all the possibilities useful to his purpose in his actual condition.

There is nothing manifests the imperfection of our character more, than the perpetually vacillating inconstancy of our actions. If every little diversity of feeling be to give a varied tone to our resolves, how can any person be enabled to form an opinion of us, upon which they might rely with tolerable certainty? An irresolute man's opinions and actions are greatly dependent upon those of others; and what chance is there either for consistency or stability, while the persons with whom he may converse or transact, are so various? A character so formed may be said to confess himself made for subjection, and will probably pass as a slave to each triumphant passion, in alternate succession, without effort of resistance or any struggle for relief. Yet it must be confessed that the regulation of all our plans must greatly depend on the course of events, which will sometimes come in an order, and in a succession, not easily to be either foreseen or prevented. But there is a very wide difference in men, in adapting themselves to the influence of the circumstances by which they are surrounded: there certainly does

appear to be something of a *sui generis* character in such cases—somewhat of an idiosyncrasy, or peculiar structure of the organization, as well as a peculiar susceptibility of feelings. Were it otherwise, how could it happen that one man should seem to govern events and mould them to his purpose, while another becomes their willing slave,—either to be led or driven to whatever point they may tend? And it would also seem strange, but it is very true, that, as in many other cases, extremes meet and produce nearly similar results. Thus, a man of an enlarged intellect and a very exalted understanding, by seeing the combination and relative bearings that one event has to another, will perceive what must occur, and will be prepared to meet it with a composure and equanimity that, to many, would appear like an utter ignorance and want of feeling. While the negation of such a character by a heartlessness, obstinacy, and pertinacity,—by subjugating every feeling, and merging them all in a wilfulness of purpose, *per fas et nefas*,—will appear to have foreseen all difficulties, and by quietly waiting the event, should seem either to have provided for them, or have discovered that they are insurmountable. By this confusion in the causes of our moving powers, or virtual motives

to action, it has been affirmed that our will is adverse to our permanent health and peace,—it mars and saps the healthful functions of our various organs, gives delusive phantasms to our perception, and makes good appear to us as evil, and evil assume the appearance of good.

In this Manual, our purpose is not simply to point out a curative mode of the various and specific diseases to which, by the dispensations of Providence, we are occasionally incident; but to give such an enlarged view of the remote and predisposing causes, which would, if not counteracted by other agents, bring into action the proximate causes upon which health and disease must depend. Now we have said, that to cultivate a love of literature and the fine arts, and to direct the taste to pursuits of usefulness, is very conformable both to health and happiness: but I may be asked, What are the circumstances that give the impulsion? What are the causes which create this inclination and this *gusto* for one pursuit in preference to another? Beyond all question, as I have previously said, it greatly depends upon a peculiar temperament or constitution of the body; nor have physiologists, as yet, been able to explain, if it be explicable, in what manner the corporeal organization affects the mind. That it does

produce immense changes is certain. We assume it as a fact warranted by experience, that there is, in the material construction of some persons, much more than in others, a something which much increases,—if it do not create,—both stability of resolution and muscular power. Sensation can only be received according to the capacity of our organs; but we have every day's experience to demonstrate that our organs may be greatly extended in power and capability of every kind by practice. But what are the circumstances that create this inclination? The enthusiasm to a particular train of thought. This predilection, both of thought and action, to a certain object of research, would, at least, be a very interesting object of inquiry.

There can be little doubt, that in the pursuit of literature, or the objects which are classed under the generic term *virtu*, there are a great variety of very intense sensations, and frequently of a very pleasurable character, which are by far too mental to be incorporated into existence by any sounds—they cannot be described by language. There are certain tastes and objects of research, which are pursued with such avidity by many persons inspired by nature or acquired by art. Do they exist independent of education, and where it is

not to be found? Is it in the power of education to produce it? See what fervour of enterprise exists among individuals. The author was personally acquainted with Mr. William Brown, the African traveller, and has had many and long conversations with him upon the subject before us. Mr. Brown thought that he first felt the wish for travel immediately after one morning's reading of Bruce's Travels, and his exertions in exploring the source of the Nile. He felt that he never should be able to remain in England, under an impression that any European had penetrated the parts of Africa which never before had been trodden by an Englishman. The same energies that actuated Columbus upon the Atlantic, possessed the mental power of Brown as he was exploring Africa. He had every comfort at home—an independent fortune, and intellectual treasures of no small extent; yet all could not induce him to be at rest. He had a presentiment of his fate. He had returned safe from his first perilous adventure;—he went again to the scene of his former travels, and, in prosecuting them, fell a victim to his enthusiasm. The motto, *Viator Caveto*, ought to be inscribed upon a monument at the spot where the enterprizing traveller fell.

Isocrates, whose lectures were much frequented, and very properly admired, imagined that he could discriminate the character, the inclinations, and predispositions, of his pupils: some he advises to follow one thing, and some another: he clearly was of opinion that organisation, and a temperament not created, but modified by circumstances and events, constituted the great variety of disposition and temper, and that it was the chief cause of all the energetic inclinations of the mind. The Jesuits established this principle, but upon a law of association of ideas; which I have no doubt David Hartley studied, and that he found it very useful to the formation of his theory. In tracing the history of men of great capacity and attainments, we occasionally find that both patronage and poverty operate as occasional causes, by the excitement they produce; one receives the praise and support of power—the other is urged by the stern gripe of necessity. This Manual has given repeated observations on the invariability of cause and consequence; which will perhaps serve to explain, that although certain causes do produce their inevitable effects, there do exist counteracting agents, which prevent from success some men who have an equal aptitude for intellectual perfectibility. Man is,

to the full, influenced as much by moral causes as by physical; but their effects are less visible, and not so well understood. Men of great talent or acquirement are rare, because a combination of those coincidences which must concur to produce the effect are still more rare. It is the power of great and long attention which generally makes one man surpass another. The attentions which have been bestowed upon biography have discovered that the faculties of the mind are not solitary gifts of nature, but are simply effects from human causes: nor does it follow that the highest faculties of the human mind shall meet with a commensurate reward, or even reputation. With respect to literary merit, in particular, the fact is notorious; for most books are more read for curiosity than for pleasure. The reader has not marked, learned, and inwardly digested, the author. It has long been a just complaint among the authors of literary works, that readers are very capricious; and it too frequently happens that, from the same causes some are greatly delighted; others are, or affect to be, either disgusted or offended. Some of the most popular writings have not been of great intrinsic value; like a meteor, they blazed for a season, and were then neglected or forgotten. An old French writer,

Montaigne, has complained that he frequently found his readers either too learned or too ignorant; and that he often could please only a certain class, who had just learned enough to comprehend him.

CHAPTER V.

The Stomach considered—The Function of Digestion explained—The grand Origin of Sympathy—Greatly affected by Diseases of several of the Organs of the Human Body.

THE stomach is an organ of great importance in the animal economy, upon the perfect function of which the principles which regulate health or disease greatly depend. It is well known, that the function of the stomach is digestion, and that this is the beginning of a process, the object of which is to produce blood from food. There is no organ of the human body which is not variously affected by the operations of the stomach: it is also the recipient of most of the remedies which are employed as a relief in disease. Various fluids are rendered subservient to the process of digestion, viz. the saliva, which is secreted by glands situated in the mouth—the gastric fluid, secreted by glands situated in the stomach—the fluids secreted by glands

in the small intestines—the bile secreted by the liver, and received into the gall-bladder, before it reaches the first bowel—the pancreatic fluid, which is formed by a gland called the pancreas: there are also other subservient fluids essential to this process. The peculiar qualities of these various secreted fluids have exercised the imaginations of many physiologists, and employed the thoughts and ingenuity of many philosophical chemists to analyze; but with no very satisfactory result. The Almighty Being has beautifully adapted them to the purpose of human digestion; and, in the healthy state, they are certain to answer the end.

When we contemplate the mode of life pursued by human beings, we immediately perceive that all their sustenance must be derived from either the animal or vegetable kingdoms; and all the animals which are fed and supported by men, to be destroyed for food, are themselves sustained by the vegetable kingdom: vegetables are nourished by water and air. Thus, if we look through nature, there appears to be a regular concatenation of causes in the production of the food for the use of man: thus vegetables assimilate water and air, and are themselves animalized by some animals, who, in their turn, become food for others. The mineral kingdom

does not afford us any proof of a nutrient principle; but we possess no facts to disprove the assumption. The human stomach receives nourishment from vegetable matter, in proportion to the gluten of its farina; but there are many vegetables without farina, which are very nourishing by the saccharine secretion they possess. The most nourishing part of animal food, by a wise law of nature, appears to be the most easily convertible into chyle.

The process of digestion appears to be conducted by the stomach; by virtue of its vital power, the laws of chemistry, or mechanics, will not explain it. The stomach certainly has mechanical power; but it is the vital principle that stimulates its glands to the secretion of the gastric juice, and also which endows it with such powerful solvent properties. There is no doubt but gastric fluid exists in the stomach of all the class of warm-blooded animals; yet it is of very unequal power in different animals, agreeably to their nature, and the food by which they subsist. It has been asserted, that the gastric fluid of the wolf has the power to render fluid, bones, and even ivory. It is less powerful in man; his food must be broken down by trituration, or mastication, otherwise the function of digestion will be imperfect. It is a remark

found to be consistent with the nature of things, and confirmed by experience, that animal food is best suited to those who are employed in laborious bodily exertion, and vegetable food most eligible to the exercise of the intellectual faculty. The process of digestion is not completed in the stomach; for the food must pass through the stomach into the small bowels, before perfect digestion take place.

I will here observe, that it is not the whole surface of the internal coat of the stomach which secretes the gastric fluid; but those parts which do secrete it are immediately known, by their great vascularity. The stomach has more a solvent property than a digestive: the function of digestion is found proceeding in the first bowel, called the duodenum. For a long time it was supposed that digestion was obedient to the laws of fermentation; but those laws, however well understood, but little explain the process of digestion. Most of the animal functions are of a peculiar nature, and most certainly cannot, with propriety, be compared to the processes of art; analogy can alone be used with beings in possession of animation and life: attempting to explain the functions of the organs of living bodies upon the laws of mechanics, or reasoning from dead to living matter, is most absurd.

The celebrated Doctor Mead has left us a memorable example of this climax of human folly. We find that air is very frequently extricated in digestion; from this circumstance some have been led to suppose that air was contained in the food, while descending into the stomach; but we know, that, in dyspeptic patients, the symptoms are not caused by food, but by the vitiated state of the digestive organ. Mr. Hunter was induced to think that the body has the power of imbibing or of secreting air: we now know that all the membranous cavities do secrete air, which is fluid in an aëriform state; and that fluid is absorbed in cavities, from which it could not otherwise escape. This fact can be illustrated by analogy. Many animals have receptacles for air; this also exists in fish: it is doubtless secreted by the highly vascular surface of membranous cavities.

I have said that the stomach is the grand organ of sympathy, and by which sympathetic affection it feels and suffers, when injuries are inflicted upon other organs or parts of the animal economy. This sympathy of the stomach, with various other organs, both in their healthy and diseased state, are many and diversified. After an acute disease,—fever for instance,—the appetite is very ravenous. While

the fever is in progression, the patient is unable to eat: but when the disease has run its course, the sense of hunger is very severe. This does not depend upon an increased secretion of gastric juice, but is owing to the sympathy of the stomach; as, during the disease, the stomach was much in arrear to the constitution: the arrears are now to be paid off. So in cases of a disease of the stomach; for instance, a schirrous of the pylorus, or lower aperture of the stomach, so as to prevent, in some measure, the admission of food into the intestines. The food is regurgitated; and yet there is a constant desire to take more; and, as little can pass to nourish the system, the sympathy of the stomach is constantly excited to send forward more. Nearly the same effect is produced by a certain stricture of the œsophagus, where there is almost an incapacity to take food. Sympathy may be defined a sensation, or action, produced in one part, in consequence of an impression being made upon another at some distance from it. The brain is an extensive organ of sympathy: whenever any impression is made on any part of the body, the mind always sympathises. The sympathies of the stomach are very extensive, as there are few affections of vital organs which do not draw it into suffering. We may

readily perceive the mutual dependence between the stomach and brain, in observing the causes and effects of headache; for, in severe headaches, sickness of the stomach is usually a concomitant symptom. The stomach frequently sympathizes with various affections of the mind: thus we see that it is no uncommon circumstance for a person of delicate feelings to be affected with sickness on seeing a surgical operation for the first time. It sympathizes with the general wants of the system, and causes that unpleasant sensation which is usually termed hunger: some have ascribed this disagreeable sensation to another principle, viz. to the irritation caused by the gastric juice, which, when secreted, and having nothing to act upon, is said to irritate the stomach. However, it is a fact scarcely to be doubted, that hunger is a sensation, not alone existing in the stomach, but also connected with another sympathy. This may be illustrated by an example:—A lady, from being remarkably corpulent, became very much emaciated, even to the extent of being a disagreeable spectacle; and at this time it was observed, she had a most enormous desire for food. The cause of this was unknown till after death; when, on examination, it was found that the mesenteric glands were in a state of disease; so that

the food could either not undergo the necessary change, or that the glands were impervious from disease, and the nutriment could not be received into the constitution.

We have a most striking instance of sympathy between the vascular system and the stomach, by injecting a solution of emetic tartar into the veins, when the process of vomiting takes place the same as if it had been received into the stomach; indeed, so universal is the sympathy of the stomach with most of the animal and vital functions, that there is scarce a disturbed function of any organ, but the digestive organ is more or less concerned in it.

CHAPTER VI.

The Liver considered; its Function explained.—The Secretion of Bile—its great importance to Health.

Various and important are most of the secretions connected with the nutrient process; but that of the liver is by far too important to be overlooked in a Manual intended to instruct Invalids in the management of their health. All the secreting glands secrete from the blood a specific fluid, different in all its properties from the blood itself; and they perform a most extensive and important office in the animal economy. Secretions are of more or less importance, in proportion as they have the power to influence healthy functions, or as they superinduce a state of disease: the secretion of bile is of such character; it assists vital organs in the performance of vital actions, the value of which, to the healthy state, can only be truly known,

or understood, by considering the mischiefs that ensue from the suspension of this fluid, or the accurate knowledge of the diseases of the liver itself, by which the secretion is made.

The liver is by far the largest of all the glands of the human body, and, in conformity with a principle of nature, it is most plentifully supplied with blood, which it requires, not only for the purposes of nourishment, and which it possesses in common with all organized parts, but because to all secretory organs an additional quantity is necessary to enable them to perform their secretory functions, as it is from the blood that all the secretions of every description are derived. It has been a long time thought that the same vessel which conveys blood for the nourishment of a gland, is adapted also to the secretory function; but they are doubtless two distinct functions, and in most cases, in all probability, conducted by different vessels.

The function of the liver will probably elucidate this principle; for the office of nutrition, and that of secretion, in this organ, is distinctly performed by different vessels. Now, it is a very remarkable fact, that there is a striking peculiarity in this organ, as compared with others in the human body. The liver performs its secretory function from venous blood; while all

other secretions of the animal, with which the physiologist has yet become acquainted, are formed from arterial blood. The vena portarum, which conveys the blood to the liver, from which the bile is produced, has travelled through the whole abdominal viscera; it is, therefore, on its return from having nourished the whole of these viscera, that it is adapted to the secretion of bile. It has been said, that all organs that secrete fluids, subservient to the animal economy, require an extraordinary supply of blood, because a double purpose is to be obtained, viz. the nourishment of the organ, and the office of secretion. Now, we know that the brain is an organ which, in relation to its bulk, receives a larger supply of blood than any other part of the body; yet its function as a secretory organ is not evident: it does, therefore, appear that organs, though not secretory, require a supply of blood in proportion to the functions they perform. A writer of celebrity has asserted, that the exertion of a secreting organ necessarily implies a considerable supply of vital energy, as it consists in changing the blood into a fluid different in all its properties from the blood itself, so that it may assume a new mode of existence. In other glands, arterial blood serves the double purpose of being the

pabulum of the secretions, and of supplying the organ with vital energy sufficient to effect its purpose; but in the liver, where the secretion is performed from venous blood, which is unfit for furnishing it with vital energy, there the necessity for a copious quantity of arterial blood seems very evident. There are many opinions among physiologists concerning the nature of the communication of the artery of the liver, which is its vessel of nutriment and presumed vital impulse, with that of the vena portarum, which is the carrying vein of carbonated blood, and by which the bile is secreted.

That most important secretion, whose influence upon health is so great, deserves much attention, and a question most worthy of inquiry arises at the onset, viz. how far the secretion of the bile is connected with any peculiar arrangement or structure of these parts, or in what manner the secreting vessel communicates with the beginnings of the excretory duct, whether by a cylindrical continuation of canals, or by the interposition of a cell, or follicle? This circumstance may serve to humble the arrogance of pretension, for men of great professional attainments have materially differed from each other upon this subject. It is not, perhaps, of so much practical importance to our purpose, as

the influence which the secretion itself has upon the knowledge of disease, and its power of affecting health. In thus asserting our inability to determine the precise structure and mechanism of the parts which form the immediate seat of secretion, we have matter of regret, as it has caused such conflicting opinions among medical philosophers, as in some measure to have occasioned coldness, or loss of friendship.

But to proceed. The circulation of the blood is much slower through the ultimate branches of the vena portarum than it is in any other gland. This slowness of the circulation probably gives an opportunity for the bile to be more perfectly secreted, and also prevents that purging which might arise from too quick a secretion of bile. Hence, in autumnal diseases, when the secretion of bile is much increased, and when it is constantly running down through the intestines, we find diarrhœa is almost always a necessary consequence. Nature has furnished a reservoir for the reception of bile in some quantity, which is called the gall bladder: we find, therefore, when the stomach is full, and when, in consequence, there is a necessity for bile to carry on the digestive process, the stomach presses upon the gall bladder, and forces out the bile into the cystic duct, from whence it

passes through the common duct into the intestine. But it may be said, why should we refer this contraction of the gall bladder to external pressure? We see the urinary bladder possesses a muscular power of contraction in itself, and, from analogy, may we not also conclude that the gall bladder also possesses muscularity? Anatomy will not enable us to solve this proposition, as no muscular fibres have been discovered in this sac, nor does it appear to be susceptible of contraction upon the application either of mechanical or chemical stimuli. But it may be asked, how, then, is it that the gall bladder can accommodate itself to its contents? That it does adapt itself to its contents, is very certain; but it does not greatly concern us to pursue this inquiry, as it is not much suited to our object. When bile is obstructed in its regular passage to the first bowel, it becomes absorbed into the mass of blood, and so, by being circulated through every part of the body, it gives a yellowness to the skin, and produces jaundice.

The cause of jaundice is usually referred to an obstruction, in some part or other, of the biliary ducts. But there are cases which induce us to believe that jaundice may, and does exist, although the biliary canals are pervious

and free. The yellow fever of the West Indies furnishes matter of proof. The character of this awful malady is a diffusion of bile through the whole mass of blood, producing jaundice; while there is such an excessive quantity of it in the alimentary canal, that it is constantly being discharged by vomiting and purging. Now, in such cases, jaundice is most clearly referable to a redundant secretion. The opinions upon this subject of Boërhaave and of Morgagni, both great men in their day, are so opposed to truth and demonstration, that it would be idle to detail them: they were founded upon the false principle, that all the secreted fluids pre-existed in the blood, and that the office of the glands went merely to the mechanical separation of those fluids. It is now universally known that the blood is the pabulum, or source, of all the secretions, and that the glands through which it circulates effect a change in its properties, each according to its peculiar mode of action; so that the secretions may be considered as new fluids created by their respective glands.

There is no such fluid as bile pre-existing in the blood vessels: it is the specific action of the liver that secretes bile. The liver is most powerfully influential in the constitution, in order to the preservation of health; and it performs

functions whose necessities are by no means well understood. The paramount importance of this viscus in the animal economy may be inferred from its early developement in the fœtus, and from its universal existence in every animal possessed of a heart: and it is well known that insects, though devoid of other glands, secrete, from the internal surface of certain membranous bags, a yellow fluid apparently similar to bile. It often happens that bile is secreted in too small a quantity, as in hypochondriacal complaints, and in chlorosis; in which diseases an unusual degree of torpor takes place, expressed, in the one case by dejection and despair, in the other by inactivity and languor. In these cases the stools are generally of a light clay colour, and the body is very costive.

Bile, therefore, is a stimulus of a peculiar kind, by which tone and energy are communicated from the intestines to the whole body. The defect of bile is more productive of disease on the first passage than the excess. In the latter case, if it be healthy in its nature, it only proves purgative; but if it be in a diseased state, it assumes peculiar powers. The ancients, and more particularly the Greeks, had peculiar terms for diseased bile, such as atrabilious, or melancholy; and in this state, when absorbed

into the system, they conceived it to produce most alarming symptoms, both in the assimilating and mental functions. The inhabitants of eastern and southern climates are much afflicted with diseases caused by the superabundant secretion of bile. Independent of its acrimonious or morbid properties, it produces a distressing languor of all the muscular and nervous powers, excessive nausea and vomiting, and, directing its course into the intestines, produces a severe and painful diarrhœa. These symptoms appear to arise simply from the effect of heat upon a sound constitution, not caused by any intemperance; nor can they always be prevented by the most careful attention to diet, nor by avoiding such irregularities as usually predispose to that disease. It is presumed that in warm climates the bile is more pungent, better, and more concentrated in its properties, than in colder regions: it is both more active as an emetic and purgative; and therefore, although the heat did not produce a larger secretion, it would, nevertheless, be more severe in its effects.

I must here observe, that in what is commonly called sick headache, which generally arises from bile in the stomach, half a pint of warm water, taken at bed-time, has a good

effect; for it must be remembered, that in all cases where bile is secreted in too large a quantity, the use of emetics is wrong: they increase the irritable condition of the hepatic system, and direct the bile from its natural course—for in almost all cases where vomits are given, bile, during their action, is forced from the first bowel into the stomach, which would certainly have been carried off by the bowels. The sense of nausea, and the action of vomiting, increase the secretion of bile; and we always find that bile is a purgative sufficiently stimulating for its own evacuation, and often requires nothing but warm water to facilitate its escape. It is a very curious circumstance, that mercurial action, in affections of the liver, seem to act as a specific: for in disturbed function, when the secretion is often vicious and abundant, it is the best remedy, judiciously administered, to procure a healthy action, which moderates the secretion; and in diseased structure of the organ, where the secretion is often either suspended or destroyed, it is the only remedy upon which we can with confidence rely. We often find the unfortunate and unhappy troubled with an affection of this organ. Whether grief, and anxiety of mind, act immediately upon the liver, or produce its effects by first weakening the powers of the

stomach, I am not able to determine; but it is open to the observation of every one who feels an interest in the inquiry, that there exists a most wonderful sympathy between the brain and the liver, and that in maniacal cases we generally find a great failure in the secretion of bile, even when we cannot detect any disease of the organ; unless, indeed, a partial paralysis of all the powers of secretion may, with propriety, be so named.

To sum up, then, the process of digestion, let us say that the food having been received into the stomach there meets with the saliva of the mouth and the secretion of the stomach, which form it into a mass called chyme: this chyme passes into the next intestine, called the duodenum, where it meets with the bile and pancreatic juice: it is by these juices changed into chyle, and in that form is absorbed into a long vessel called the thoracic duct, which empties itself into the left jugular vein, where its contents renovate the mass of the blood. The useless portions of the food pass off by the course of the intestinal canal.

CHAPTER VII.

The Healthy Function of the Digestive Organs.—The Chyle, or vital Principle of the Food.—Imperfect Assimilation of Chyle into Blood, the Cause of what is commonly called Breaking-up of the Constitution.—Rules for Prevention recommended, and Remedies proposed.

It has been before remarked in this Manual, that certain changes are produced upon food by the function of the stomach, and that when either animal or vegetable matter has received the stamp of life, a train or series of peculiar actions must, of necessity, take place. Notwithstanding those actions are of the very essence of life, they have a tendency to exhaust or wear out the animal machine; and this waste must be made up to the constitution by nutritious animal or vegetable matter. The change which the stomach causes upon substance has been already observed; but this nutrient matter is subject to other changes, and which take place in the intestines, in the process of what is

usually called chylification, and also in the blood-vessels, in what is termed sanguification, and still further by the extremities of these vessels, by which it is converted into a living solid. Digestion has been already shown to be a process simply of solution, by which the food is broken down by the stomach, and is thus prepared for the process of chylification. It may probably be asked, where does the function of chylification take place? It is answered, certainly not in the stomach; for when the body of an animal is opened immediately after he has taken food, no chyle is to be found in that cavity; there will be nothing found there but a mass of digested matter ready to pass into the duodenum, or the first bowel; nor will chyle be found even in this bowel,—at least not in the upper portion of it: there is here to be found only a soft, pulpy substance—the digested food, called chyme. As chylification does not take place in the stomach, nor even in the upper portion of the first bowel, it cannot but be very interesting to inquire where this process does begin, and what are the agents which nature employs to effect it. This discussion would be liable to seduce us into a wide field of speculation; but it is the purpose of the writer of this Manual to shun the delusions of

theory, and to attach value only to facts. Lord Bacon says, that the knowledge of truth is the sovereign good of human nature. In our present research, we have to deplore that facts will not bear us company through the whole of our journey. In the first place, we may inquire what is the nature of chyme? Various opinions are entertained concerning it; the description given is that it is very like paste, of a greyish or sweetish taste, slightly acid, and retaining some of the properties of food. It may be presumed that there are as many species of chyme as there are varieties of food. The solvent, antiseptic, or antiputrescent properties of the gastric secretion, we have said, cannot be explained by any of the known laws of chemistry. Various experiments have been made by Spallanzani, Magendi, and others, by introducing tubes, with various descriptions of food, into the stomach, and observing the various effects produced upon each by the action of the secreted fluids to which it has been exposed. All these experiments, however, from many circumstances, must be very imperfect and inconclusive. In the stomach, without the tube, the food is pressed and agitated; both the saliva and the gastric fluid are constantly secreted and combined with it, and as soon as

the chyme is formed it is carried away. We have no facts to demonstrate whether, in the formation of chyme, there is any extrication or disengagement of fluids in a gaseous state; and it is very likely that while the vital actions are regularly and healthfully performed, there is no such product; but in imperfect actions or disturbed functions of a morbid nature, the laws of chemistry may obtain an existence, and gases may be formed similar to what would take place in a given temperature and motion. In the decomposition of analogous substances out of the body, it does not appear, from observation, that there is any chyle at the beginning of the intestines; but if we proceed in our search a few inches farther, we shall find a white substance of a bland, mild taste, adhering to their sides—this is the chyle; the process which forms it, whatever it may be, is a vital action, and very rapid; for chyle is found to exist in this part very soon after food has been taken. When considering the stomach, it was observed that there was a much greater degree of vascularity distributed over it, than was necessary for its nourishment; and from this abundant vascularity the gastric fluid was formed. In proof of which it was asserted, that the vascularity was chiefly distributed over the inner

surface of that organ. The same rule of analogy will here be observed; for here is a much greater degree of vascularity than is necessary to sustain the intestine: and we find, upon opening this bowel, there is a mucous secretion which is formed by the force of the circulation being directed to the villous coat, from and by which the mucous is poured forth. The intestines are also prepared with an apparatus of round, circumscribed glands, which secrete a fluid very much resembling the mucous: these glands have received their appellation from their particular disposition, or from the names of the anatomists who have paid particular attention to them. But are we to suppose there are no other agents than these to effect the important and vital process of chylification? We have the pancreatic secretion to assist in the producing this effect. The sphincter muscle of the pyloris having relaxed sufficiently to allow the food in solution to pass into the superior portion of the first bowel, it is immediately exposed to a very copious secretion of bile, and what is commonly termed pancreatic juice, whose agency in the purpose of chylification is very efficient, but the *modus operandi* is wholly unknown. The sensible effect visible to the physiologist, is an immediate precipitation of the nutritious

portion of the food, or chyle, from the feculent residue. The chyle separates from, but cannot be remixed with, the rest of the mass. It now adheres to the coat of the intestine, and may be easily perceived entering the absorbent vessels, under the aspect of a fluid resembling milk; from which resemblance this class of absorbents have been termed lacteals. It has been observed, that the gastric fluid, in many animals, has intense powers of solution. It has also been observed, that all mucous surfaces, or membranes, are possessed of great vital energy and vascularity; they abound, both with absorbent and exhalent vessels, and are amply supplied with nerves, by which the small glandular bodies, termed follicles, are stimulated, and secrete the peculiar fluid agreeably to the structure; and such it was observed was especially the case with the mucous membrane of the stomach. It was also noticed, that the particular portion of the inner surface of this organ that secreted the gastric juice, was known, from the number of vessels there greatly exceeding the purpose of nutrition. But the chyme having reached the intestine, solvent power was here superfluous, and the secretion from the glands of the intestinal canal, either do not exert, or perhaps possess, the solvent and coagulate

powers exhibited by the gastric fluid. The vital energy, also, of the intestines is certainly either less powerful, or less developed, than those of the stomach, having a function of a limited nature, although efficient and peculiar to its purpose, contributing but little, perhaps, to the concoction, as it is called, of the aliment, but greatly to the absorption of the chyle. The agency of the pancreatic juice in the process of chylification is proved from the fact, that in all animals that have been opened, either while living, or after death, no chyle has ever been found above the opening of the pancreatic duct into this intestine. Some physiologists have ascribed a power to the bile in the formation of chyle: the fact of the pancreatic fluid being admitted as an auxiliary, they insist that the bile has the same pretension, on account of the anatomical structure of the biliary duct, which unites with the pancreatic duct, and they both become one duct on entering the duodenum. However plausible these circumstances may be, there are others which might be named, that would more than outweigh them; it is not, therefore, assumed, that bile is a component part of the chyle: the office of the bile is to produce a separation of the nutritious fluid from the excrementitious residue;—in fact, to

separate chyle from chyme. We here clearly perceive the very great importance to the animal economy of the bile, independent of its purgative properties, and facilitating the exit of the excrementitious matter; and this is the cause, when the liver is diseased or its functions impaired, of the very great emaciation which constantly ensues. The liver, which is by far the largest of all the glands, would seem to have a very subservient office, if bile were employed only to purge off the fæces; but when it is demonstrated that an essential property of bile is to separate the nutritious fluid termed chyle, from the solution of the digested mass, termed chyme, its vital importance is immediately established. The pancreatic liquor which enters the chyle, is separated or secreted from the blood by a considerable gland called the pancreas, and which receives its blood-vessels from the splenic artery; it is extremely vascular, which is very necessary for its secretory purpose; its vessels are very small, but they are very numerous. The internal structure of this gland very much resembles that of the gland which is situated behind the jaw, and which secretes the saliva. The extremities of the blood-vessels terminate in small cells, from which arise several small ducts, and which verge to one common duct, from

every part of the gland. This duct, as before observed, empties itself, in company with the biliary duct, into the intestine; but these two ducts pierce the substance of this intestine by two separate openings, and unite before they perforate its coat, and open into its cavity by the same orifice. There are, however, exceptions to this rule in the human species, and very frequently in animals. In birds, more particularly, there are several pancreatic ducts entering the intestine; in rabbits the pancreatic and biliary orifices are constantly found separate from each other; and in fishes the structure in this part is very peculiar indeed. It is, in fact, a matter of reasonable doubt whether the substance called pancreas in them answers the same purposes as in the human subject. There is certainly an analogy; for that substance which Mr. John Hunter called the pancreas, consists of a number of bags or processes, but of its uses we have no data upon which to found any facts useful to our purpose.

It is to be recollected, that the object of inquiry, viz. the process by which a nutrient fluid is absorbed into the blood, is of vital importance to an invalid, as a tolerable knowledge of the principles upon which the process depends may

greatly facilitate the attainment and the preservation of health. A knowledge of chemical affinities will lead us but a little way, for vital functions very much vary the character of chemical agents and re-agents. The various names given to qualities of fluids, as alkalis or acids, with their divisions and subdivisions, may be considered as a *copia verborum*, or mere sounds.

That chylification is not a slow process, has already been said; but it may not be equally quick in all animals: for instance, in herbivorous animals this process will be much slower than in the carnivorous; for as the formation of chyle is a process of animalization, animal food will be much sooner assimilated than vegetable. The apparatus of chylification in these animals varies accordingly; for while the herbivorous animal has a great length of tube of intestine, its structure is membranous; the carnivorous animal's tube of intestine is relatively short, but of a strong muscular structure In the herbivorous creature, owing to the length and little contractile force of the membranous canal, it suffers a slower and gentler action than in the carnivorous creature, where the muscular structure is powerful in contractility. It would be interesting to the curious to be able to subject chyle, after its separation from chyme, by the bile, to analysis; but a

sufficient quantity can scarcely be procured for the purpose. A portion was collected from the rupture of the thoracic duct: in that condition it was found to contain mucilage oil and coagulable matter, with a portion of gas. This experimental analysis was made by a very worthy and intelligent physician, Dr. David Macbride, than whom none was better qualified. His object went particularly to prove the similarity of chyle with milk; but milk, in addition to the other qualities of chyle, contains much saccharine matter, and there are many reasons to conclude them to be perfectly distinct fluids. In order to prove this, let us consider milk taken into the stomach as food. It is there subject to coagulation, and various other changes, before it becomes chyle. Again—if, by a process of injection, milk be thrown into the blood vessels, instead of nourishing the body, which it certainly ought to do, if similar to chyle, it at least harasses and greatly distresses the animal. Some have declared that it has caused death. Chyle is generally white in its colour, but not always so: in birds it is pellucid.

Before closing our observations upon the important function of chylification, it will be necessary to mention a structure commonly called the milt, or spleen, which is a viscus of a

deep black or red colour in the human species. It is situated in the left side, immediately under the diaphragm, and above the kidney. The figure has little influence on the functions of the viscus. In man it may be said to be a depressed oval, nearly twice as long as it is broad, and almost twice as broad as it is thick; but in brutes it is of an oblong form, and in birds it is globular. The size is also subject to very great variety. I have seen a spleen in a healthy state not weighing more than one ounce, and I have seen another, without the least trace of disease, weighing more than one pound; but in a state of disease it frequently increases in size to the extent of several pounds. It is a curious fact, that the milt, or spleen, changes its colour as life advances. In infancy it is red, in old age it is livid, blue, or carbonated; and in the ratio of the age does the colour vary from red to purple, or blue. The peculiar situation of the spleen renders it liable to pressure both from the action of the diaphragm and the distention of the stomach. The spleen is very plentifully supplied with blood vessels, far more numerous than appears to be essential to the nourishment of itself; and when this is the case with structures in other parts of the body, we discover that the

superabundant supply of blood is appropriated to the function of secretion; but with respect to this viscus, anatomists have hitherto been unable to find an excretory duct; nor does it exhibit any irritability: its very existence is confined to the class of animals called mammalia. Many of the ancients believed the spleen to be a gland, whose office it was to secrete the black bile; while others believed this office to belong to the liver; but they agreed that the fluid was secreted by one or the other, or by both, and that it laid the foundation of the disposition, temper, and also of the character of the individual, and that its powers were so active, that when it was absorbed it produced madness.

The absence of an excretory duct to the spleen, has made it questionable if it be really a gland. That it has been extirpated from animals without much prejudice, and has even been taken out of the human body, when in a state of disease, with safety and recovery to the patient, are facts which would induce us to believe that it is not of primary importance to the animal economy; yet if we reason from analogy, we must be induced to believe that the spleen is, in some manner which may be inexplicable to us, subservient to the process of supplying the blood with chyle, because it is an established principle

that very formidable, nay even fatal, diseases, may, and often do, attach to organs subservient to excrementitious purposes, without the creation of hectic fever, or the least emaciation; for instance, large stones have been repeatedly found in the bladder, and extensive ulcerations from stones in the kidneys, without the production of hectic fever, or without their having in the least diminished the bulk of the body, or having shown any symptom, during life, by which their existence could even be known, or even suspected.

Nor are we to imagine that pain simply acting on the nervous system, unless accompanied by vascular excitement, will have much power in reducing the bulk of the body; but the spleen will not be subject to disease any length of time without subjecting the system to the most severe emaciation, attended with hectic and violent vascular action. This fact is conclusive that the whole constitution is roused by sympathy into consent with the affections of this viscus, and that its diseased state is inconsistent with the safety of the individual. A proneness in the system to reduce the bulk, as the disease should happen to be situated in particular parts, is in itself both a very curious and remarkable circumstance, which, by introducing either high vascular

excitement, or diminished powers of chylification, produces that melting away, that dissolution of all the animal and vital powers, with extreme emaciation, that has been not inaptly called valetudo conquassata, or breaking up of the constitution.

The symptoms of this malady are the following: great inability to exertion, a general prostration of all the animal powers; the vital actions are performed with diminished energy; a paleness or sallowness of the face; a particular exhibition of features called the facies hippocraticæ; occasionally a bloated face, with thirst and shortness of breath; palpitation of the heart; troublesome flatulence; in some instances loathing of food; sympathy of the stomach; very great secretion from the kidneys, and most harassing diarrhœa; swelling of the legs; spasms in various parts of the body; fever, trembling, and numbness of the extremities succeed as the disease advances; great languor, drowsiness rather than sleep, with utter oblivion of common incidents; disturbed perceptions of the mind; watchfulness, and muttering delirium;—these are the most remarkable of the symptoms. The causes which produce them appear to arise from the following diseases, chiefly of glandular structure, and uniformly of those

glands which are contributing a fluid essential to the nourishment or support of the constitution. A comparison of the ravage of disease upon peculiar structures, will illustrate the facts of the proposition. First make a comparison of the diseased state of the mesenteric glands, and a diseased or a scrofulous affection of the breast in the disease of the mesenteric glands: there is very great emaciation in the scrofulous breast, none at all in an ulceration of the small intestines. Where the process of chylification is affected, great emaciation takes place; in a schirrus, or even cancer of the rectum, none. In a disease even of the gall bladder, which is subservient to chylification, the bulk of the body is rapidly sunk; but in a disease of the urinary bladder, which is subservient to the excretory office of the kidneys, little, if any, diminution of bulk can be perceived. Also, in an abscess of the liver, the body becomes much emaciated, but in an abscess of the kidneys the bulk is not diminished.

These circumstances will much illustrate the nature of what is very properly called a break up of the constitution; for if we minutely examine into the functions of those organs, the diseases of which either do or do not occasion emaciation, we may most probably be able to

ascertain the true causes of the differences of the symptoms; as also their effect on the bulk of the body. It will be necessary, in order to understand more clearly how the functions of those parts bear relation to each other, to bear in mind that all the glands of the body have specific functions; some secrete a fluid from the blood, for the use of the system; while others secrete a fluid to be discharged from it. The first may be called glands of chylification; the other glands of exuvia, or waste. It has already been more than once observed, that the small intestines abound with a multitude of absorbents, and, from their high vascularity, are known to be secreting surfaces, furnish a fluid for the support of the system, and are to be considered as performing the office of glands of supply.

The structure of the large intestines corresponds with their function, inasmuch as they are furnished very niggardly with absorbents, but abundantly with a set of glands, which secrete a fluid, or perhaps, more properly, excrete, or withdraw from the system a mucous which lubricates the canal for the passage of the fæces, and which itself, together with those fæces, are destined to be discharged from the system as exuvia, or waste. It has long been known

that those parts which secrete a fluid to be employed to the support of the system, as well as the glands of immediate supply, may be considered the liver, the pancreas, the mesenteric glands, the glands of the stomach and small intestines, and, most probably, the spleen; on the contrary, the parts of waste are the kidneys, breasts, exhalent arteries, perhaps the uterus, and certainly the large intestines. We may, therefore, with certainty, be convinced that what is called the break-up of the constitution, is some affection of the organs of supply—some of the parts subservient to chylification. The best mode of prevention is scrupulously to avoid all excess, as the principal productive cause; to endeavour to restore the ebbing energies by light and nourishing food, carefully avoiding all stimulants, and by using exercise in the open air, in proportion to the strength. The curative process is more difficult, as it is most commonly a diseased structure in some of the organs. Perhaps a slow process of mercurial action introduced into the habit, by friction upon the skin, is the most likely remedy to give efficient relief. But this must not be done without the special superintendence of a physician.

CHAPTER VII.

The Process of Respiration considered.—Qualities of the Air breathed.—Wholesome and Unwholesome Atmospheres.—The Effects of different Gases considered upon the Health of Invalids, in their various chemical Combinations.

The process of respiration in the human species, and indeed in all the classes of animals containing warm blood, is a process immediately essential and necessary to life: it cannot even be suspended many minutes without producing a cessation of all the vital functions. Death is the result. This function takes place in man, and other analogous creatures, almost instantly after the infant is taken from the uterus of the mother, and exposed to the action of the atmospheric air. The circulation of the blood, and the continuation of life, is ever after dependent upon this process.

The lungs are a hollow, cellular, or spungy mass, capable of containing air, and amazingly dilatable by it. In an infant who has breathed

for some time, the whole blood of the vena-cava passes into the right ventricle of the heart, and thence into the vessels of the lungs, where it undergoes a process from the contact of air, at present not fully known, but which has given birth to numberless theories. Inspiration and expiration, which double operation is called respiration, is variously modified by the will, and by certain emotions and passions. They are also often excited by imitations; and they are very much affected by the desire to remove pain and uneasiness, which operate more frequently on respiration than upon any other function of the animal economy. In the common condition of most invalids, the fact of respiring air perfectly congenial with health is of the greatest importance. There is a peculiarity in the nature of different people which will render abstract rules very uncertain; but generally the air of large cities is very unfit for healthful purposes. There is another very common error—that air cannot be too pure. For the purposes of preserving or attaining health, a proper combination of aëriform fluids is what constitutes that state of the atmosphere which fits the air to be inhaled into such a delicate and important structure as the lungs; perfectly pure air would be very unfit for the purpose: for instance, air very highly

oxygenated, which is an approach to what is called purity, would be very improper to a patient labouring under a disease commonly called spitting of blood, and has been uniformly found to accelerate the death of the patient. It is certain that living in large cities is found greatly to shorten the average duration of human life; not only is its duration diminished, but its healthful state is much deteriorated. In Constantinople, Grand Cairo, Vienna, Berlin, London, and Paris, it is invariably found, that not only the healthful state, but the average duration of human life, from what it is in the surrounding parts of the country, is greatly reduced, and that the invariable effect is justly attributed to the cause specified. We find, by unerring experience, that the effect is produced nearly in the ratio of their density, and in the attention which they pay respecting the removal of the fœtid exuvia arising from decomposed animal matter, even the effluvia, which is, in other words, gaseous fluids, escaping in an aëriform state, are extremely prejudicial to health. It has been asserted that, of all animals, man is least qualified to herd together in multitudes; for the breath of man may be said to be very hurtful to his fellow creature. This is not simply a metaphor, but practical experience demonstrates its truth. The moisture

and thickness, as it is commonly called, of the air, is one cause; but the animalization which it acquires by so many people being crowded together, is a far greater. Experiment has demonstrated that the same air cannot enter the lungs more than four times without acquiring properties hostile to human existence. Reflect but for a moment on the nature of that atmosphere where it is next to impossible for an inhabitant to inspire a mouthful of air that has not been for some time already in the lungs of another party. Let those who are able, and have plenty of means, avoid living in great cities, which may be called the sepulchres of the human species; and not only in a physical, but even in a moral, point of view, it is next to impossibility that an invalid can receive benefit, when he is respiring a product of air arising from the chemical combination of a variety of aëriform fluids, which produce a new compound to the circulation through the air-cells of the lungs. When those aëriform fluids become incorporated with the blood they not only become a part of the pabulum by which all the organs of the body are nourished, and the nervous power supported, but also furnish the material from which all the secretions are produced, and the secretory surfaces and organ sustained. The natural inference

from these premises is, that they must give a decided character, not only to all the corporeal energies, but a tone and influence to all the sentient extremities of the nerves, affecting all the perceptions of the body, and modifying the process of thinking: the whole man must be changed by the source of all health, cheerfulness and hilarity being thus polluted at its source. The *modus operandi* of respiration has been variously explained. Some have supposed respiration to depend upon the action of the moving powers in other parts of the body; for instance, from the pulsations of the pulmonary arteries; but it is sufficient to observe, that the actions of the lungs, and the pulsations of the arteries, are by no means alike. Others have asserted that respiration depended upon the muscular power of the lungs, by which they contracted, after permitting distention to a certain degree; but no muscular fibres will be found in the lungs; their structure are cellular. These viscera are, therefore, to be considered as mere reservoirs of air, which become distended from the chest enlarging, and leaving a vacuum between it and the pleura, in consequence of which the external air rushes through the trachea, distends the air-cells of the lungs, and thus fills up the before-mentioned vacuum,

between it and the pleura. It is very evident, that in each inspiration the abdomen is protruded a little forward. If we place our hands upon the abdomen, and so prevent the descent of the diaphragm, we shall find that other muscles will be called into action to elongate the chest. The same thing happens very commonly in persons afflicted with asthma and difficult breathing; so that when a man is remarkably short of breath, it is very natural for him to press his hands upon some solid body, so as to fix the scapula, and give the muscles arising from them a fixed point to act from. I once knew a gentleman who was greatly afflicted with asthma, and I could easily discover, even when walking behind him, whether his asthma was either better or worse at that time; and this merely by the motion of his shoulders. Respiration is a function partly under the control of the will, and partly not: thus a man may breathe either quicker or slower, according to his wish; but if he endeavour to suspend respiration, he will find that, after a certain time, an unpleasant sensation will arise in the chest, which will oblige him to use efforts to inhale air. As breathing is equally well carried on during sleep as when we are awake, it would seem that, although our will has a power over the organs of respiration, yet still that process

goes on much better without its directions; for if any person should attempt to direct every motion of his lungs, he will very shortly find himself fatigued; but if he allow those motions to proceed without any effort of the will, no fatigue will ensue. The final end of this structure of the lungs we shall consider as we proceed. Jubertus, an ancient author, considers with great accuracy the highly important character of all the aëriform fluids that get united with the pabulum of life through the air-cells; and Paulus says, that if air be impure and foggy, it dejects the spirits, destroys hope and courage, and causes sometimes mortal diseases, by a direct affection of the heart. Thus ancient authors observed the fact, although they could not perhaps physiologically discover the cause. More modern physicians, and among the rest the late Dr. George Fordyce, whose enlarged intellect very much reflected upon the subject in question, had many and long conversations with me. The doctor was greatly disposed to believe, that all the various attacks of what is commonly called fever—from the most malignant form, viz. plague, whose simple attack in many cases is fatal, without giving the heart an opportunity of reaction, to the simple continued fever, and where the powers of the

constitution overcome the disease — may be attributed, in various degrees, to noxious principles being introduced into the blood through the lungs, and by those means destroying the functions of the brain and heart; and if such minute particles of fluids, which escape the sight, are capable, by acting as a direct poison, of destroying us instantly, can we wonder that all the intermediate degrees of noxious particles, of less direct power to kill, may have sufficient scope to disturb all the healthful functions, and give a delusive perception to the senses, and a melancholy tinge to all our thoughts and ideas, so that life itself may be comparatively of but little value?

Lemnius, an author by no means to be overlooked upon this most important subject, says, *Qualis aer talis spiritus, et cujus modi spiritus humoris.* Hippocrates, in one of his aphorisms, and, indeed, throughout the whole of his works, indispensably insists on the purity and healthful nature of that elastic fluid, which must soon become a component part of the living principle, if it enter the air-cells of the lungs, and must influence all our thoughts and actions. The air itself undergoes both a chemical and a physical change in its passage through the lungs. Its temperature is nearly the same as that of the

human body; but there escapes from the lungs a great quantity of animal fluid in the state of vapour, at every expiration: this has been called by some, pulmonary transpiration. Whatever name you may give it, it possesses chemical properties very different from that of the inspired air. The proportion of azote is much the same; but that of oxygen and carbonic acid gas is very different. Whilst the air, in its passage through the lungs, becomes thus modified in its physical and chemical properties, the venous blood traverses the ramifications of the pulmonary artery, of which the tissue of the lobes of the lungs are partly formed. It then passes into the minute branches of the pulmonary veins, and very soon into the veins themselves; but in passing from the one to the other it changes its nature—from venous to arterial blood, by absorbing oxygen from the air breathed. The function of respiration has a final purpose, which appears to be twofold, viz., to communicate a vital principle, called oxygenation, to the blood, and also to develope animal heat. Slow were the progression of facts upon this part of the animal economy. During the existence of what has been commonly called the mechanical philosophy, it was thought that air merely distended the lungs to give facility to the passage of the blood through the

vessels; but it began to be considered that something more was necessary, than merely for the blood to have a facility to move through the lungs, and that some effect was produced upon the air itself upon the blood. As it was now assumed that some change was produced upon the blood by the air, it was also thought that this would throw some new light upon the functions of the lungs themselves, and upon the nature and use of respiration. It therefore became a matter of serious investigation among philosophers and physiologists; and various experiments were instituted to elucidate the subject. Among others, an animal was procured and placed under the glass receiver, and after a time it was found dead: the explanation of this fact was found to vary with the philosophy of the times. When this experiment was first made, the chemical qualities of the air were then in a great measure unknown; therefore all the effects of air in respiration were attributed to its mechanical properties, which forced it into the lungs, and obliged them to expand. It was, however, soon known, that air once respired became impure; and an endeavour was made to account for the impurity of air respired, that there was something absorbed from the air. This opinion, when first brought forward, was

supported by many very respectable and intelligent people; but they conceived this something to exist in an aëriform state in the blood-vessels. This, however, was completely disproved by an experiment upon an animal, the particulars of which we decline to name in this place.

At or about this time, physiologists discovered that air, thus rendered impure by respiration, would extinguish a candle; and, on the contrary, where combustion had been long carried on in a certain quantity of air, that air became unfit also for the purposes of respiration: therefore they concluded that they were similar processes, and capable of being mutually explained by each other. Various speculations were brought forward upon this subject. As the air was rendered worse, and as a candle was extinguished by it when respired, it was supposed that a quantity of fuliginous matter was evolved during expiration. This was called phlogiston; and as it was found to exist in all combustible bodies, Stahl thought that the blood contained this in different proportions. And some experiments made by Doctor Joseph Priestley seems to corroborate this opinion; for after having included a portion of atmospherical air in a receiver, he exposed it to a quantity of venous blood: after some time it was found

that the blood had changed its colour, and on examining the air it was found to be phlogisticated. To air already phlogisticated venous blood was exposed, and in this no change of colour was found to ensue; but when placing a vessel containing arterial blood, where the air was phlogisticated, then the blood became darker, and the air was ameliorated. But before we enter into a further investigation of this most important subject, it is proper that we should explain the nature and properties of the atmospherical air. This consists of three parts: the larger part is the dephlogisticated air of Stahl; or, as it has been called from its fatal effects on animal life, azote; or, from its being found the basis of nitros acid, nitrogen. This, though the most abundant, is not by any means to be considered the most useful; on the contrary, it acts altogether as a diluent upon the more useful part of the air. The air next in quantity is the dephlogisticated air of the elder philosophers; now called pure or vital air, from chiefly contributing to the support of animal life; or by chemists it has been called oxygen, as being the basis of all acids. Besides these two airs, there is a small quantity of fixed air, or what has been commonly called mephitic gas, or aërial acid, but which is now generally known

by the term of carbonic acid gas; and it obtains this name, as being obtained chiefly from charcoal. The proportion of these airs, or gases, are of course very various, and constitutes what is commonly thought to consist of wholesome or unwholesome air; but modern chemistry has afforded the means of informing us, that there are a great variety of gases distinct in their character, and certain in their effects. The researches of a modern chemist all tend to give valuable information of this kind; and there can be little doubt but almost all the anomalous and painful feelings of a sudden character, and which cannot be referred to any particular source, have their origin in this cause. The proportions of factitious airs must have a reference to different situations: as the air of the country will be more pure than that of a crowded city, the air of a charnel-house is of course less pure than the external air. Various methods are adopted for the purpose of analyzing of air; and some are very accurate as well as curious. A certain quantity of oxygen is necessary in order for the process of combustion to go on; as we may prove by exposing a candle in an inverted jar with a certain proportion of atmospheric air: in which situation the candle will in time be extinguished,

and the gas will be found deleterious to animal life. This may probably be accounted for from the absorption of pure air. But how shall we account for the increase of fixed air? It is probable that this carbonic acid gas is similar to the fuliginous matter, or to the phlogiston of Stahl; but these philosophers considered this as an element that was evolved in circulation. But modern chemists, who have carried their own views of this matter to a much greater extent, are inclined to believe fixed air not to be an element, but a compound of a substance which they call the carbonaceous and oxygenous principle. Hence, then, it seems, that the fuliginous matter, or phlogiston, may be this carbonaceous principle. They also conceive that oxygen or pure air is itself a compound of the oxygenous principle and of caloric, or the matter of heat. Fordyce has been considered a chemist of the old school: he declared that he had no doubt of the fact, that an almost infinite variety of mephites does exist: no doubt various in their compounds, but equally destructive to life. Usage has adopted the term mephitic for any thing that has a disagreeable smell. The carbonic acid has been called the mephitic acid; nitrogen has been called the mephitic air; but the true derivation of this term, from which

it ought never to have been diverted, is mephuhith. It is either Syriac or Arabic, and literally means a blast; and the name is well applied to the thing. What existed in the mind of Fordyce has been demonstrated by modern chemists; but sufficient credit has not been given to the master-mind that pointed out the truth; nor is credit given, even yet, for its wonderful effects, and which will be further elucidated in the following chapter.

CHAPTER IX.

The Animal Economy variously affected, both in Health and Disease, by aëriform Fluids introduced into the Blood through the Air-cells of the Lungs.—Their extensive Power over the whole Nervous System in the Valetudinarian State.—The Atmospheric Air the Source of Animal Heat, and auxiliary to Muscular Power.

When a party in perfect health, without any warning or notice, *uno ictu*, like the electric fluid, is deprived of life, it is very commonly supposed that a spasm of the stomach, or an apoplexy in the head is the proximate cause of death. In Egypt, in Turkey, and in some of the islands in the Levant, they attribute these awful visitations to their natural causes. Ignorant of the structure of the human frame, ignorant of chemistry, they assume no pretensions to abstract causes, but form their opinions simply from the effect. He or she hath died of the blast, is a very common exclamation. Whole

caravans of pilgrims, in journeying over the Desert, have been suddenly overtaken, and have as suddenly perished. When an attack of plague is sufficiently powerful to paralyze the nervous system and the heart's action, the mode of death is the same, or nearly so. There is such an utter extinction of all the powers of life, that the brain and heart, those vital organs, are unable to make any resistance. Nature forms those chemical gases in her elaboratory; no doubt they exist in a very great variety of characters or bases; but as they are, in their concentrated form, productive of death, we are greatly concerned in their analysis, so that we may be enabled to avoid them, even in their diffusive state. The coal miners have more correct ideas frequently upon this subject, than those who are denominated the wise and the prudent. They frequently lose their fellow-workmen, and they not uncommonly fall victims, one after another, in the endeavour to recover the dead bodies of those who have perished. The determination of trying to save a comrade, if possible, induces them to risk, notwithstanding all their experience, a similar fate. In their phraseology thy call it the "chope damp," and a proper popular name it is to designate the thing. It is very probable that the base of this poison is a highly concentrated carbonic acid gas. We

also find that air that has been frequently expired, is also very noxious; yet how the deleterious effects are produced, we are not very certain. Experiment is said to convince us that the loss of pure air is about thirty parts to one. Now, if this be the case, more than a fifth part becomes fixed air, which is deleterious and mephitic. A question would arise—are the deadly effects of fixed air to be imputed to its preventing the accession of pure air, or entirely to some poisonous principle inherent in itself? The latter seems the most probable from experiment, for an animal will live longer in air deprived of its oxygen, than in air containing much of the carbonaceous principle. We find the amphibia, as frogs, newts, turtles, snakes, &c., will continue to exist a very long time in air deprived of its oxygen. An experiment has been tried—how long a frog would live exposed to fixed air. From a mixture of chalk and vitriolic acid, from which a stream of fixed air was extricated, and to which the frog was exposed, the animal died in about five or six minutes. Hence, it appears evident that fixed air has an inherent noxious property, and whose action is particularly confined to the lungs, as fixed air can be thrown into the stomach without any bad effect, and as is often done under the form of mephitic

alkaline water in disorders of the kidneys. Hence, it would appear that something noxious is separated from the blood, which, when it becomes abundant, destroys life. It is also certain that this something is less slowly separated in some animals than in others, and in consequence of which their life is protracted. This is not matter of opinion, but is a law of nature, and may be demonstrated by an inspection of the structure of the lungs of amphibious animals, as well as by the writings of Blumenbach and others. The air-cells of these animals' lungs are constructed much larger than in other animals; they can therefore exist much longer in certain portions of air, because there is less contact of surface between the air and the blood, than there is where the air-cells are smaller. And here I cannot but observe, how ill-rewarded frequently are those enthusiasts who have literally sacrificed themselves to the pursuits of science. The great and almost-forgotten John Mayow neglected no means, either pecuniary or otherwise, to obtain a knowledge of pneumatic chemistry, by which he very materially illustrated animal physiology and human pathology. He possessed a knowledge, the value and bearings of which his contemporaries had not amplitude of mind sufficient to appreciate. He acquired a more

accurate knowledge of respiration and of its effects, than any man of his time. There is much vague and desultory matter in his writings, but this does not detract either from their importance or value. His treatise on Respiration, that on the Rickets, that also on the Respiration of the Fœtus in Utero et Ovo, and on Muscular Motion and Animal Spirits, discover a research far above the level of his time. Yet what was the result? He was suffered to perish, unappreciated and unmourned, at the early age of thirty-four; nor was his equal produced in this country till full a century after his decease. It would thus appear that the happiness and well being of individuals are sacrificed to the interest of the species, diminishing the value of life in the abstract, to increase its value in the aggregate; but such things have ever been, which induced Bishop Hall to exclaim, "Were I a leech, the liberal man should live, but I would have the carl to die." The observations made upon the nature and properties of the atmospheric air, will convince any person that not only our invalid has, to a certain extent, a command over the physical agents that influence his health, but his longevity also may be promoted by a serious attention to the subject; for what is life but a peculiar chemico-animal operation—a phenome-

non produced by a concurrence of the united powers of natural causes, with matter in continual action and perpetual change? It is not left to chance; there is no contingency but has certain invariable and defined laws for its government. Thus ignorance abridges life, and knowledge extends its duration. By attending to just principles regarding its essence and its wants, and by attending to observations made from experience, the circumstances under which this process may be hastened and shortened, or retarded and prolonged, can be discovered. Upon this are founded those regulations which instruct the invalid in the best medical mode of treatment in the various and anomalous symptoms by which he is afflicted. The rules for the attainment and preservation of health include also the science, or the knowledge of the means of extending life to the longest period allowed to mortals. The art of medicine, in promoting health, must have a relation to the peculiar state of the patient, and the disposition of that particular habit. But the science of extending life is regulated by general principles, and it has been found occasionally that the existence of certain complaints does not diminish the duration of the life of the individual. Who has not often heard of that wise remark,

by the vulgar—"I do not hold with doctors, for we must all die when our time comes?" It is very true our days are numbered, and so is the measure meted out to us of the proportion of wisdom and of folly; and by which standard it will ever be found that the number of our days will be increased on the one part, and as surely diminished on the other. Health and long life will be the reward of those who will be at the pains to obtain the knowledge of the causes upon which both depend. The theologist, indeed, who no doubt wishes to enjoy the good things of this world without losing his reversion in the next, and to whom godliness is at present great gain, may sneer at this attempt to procure health or long life, and ask if the quantity of health, and the duration of life, are not already determined by infinite wisdom to every human being? He may also add, "Can you, by thinking, add one cubit to your stature? Why every hair of your head is numbered." All this is very true; but to every effect there must be an adequate cause. Nature, in her progress, disregards theological dogmas, but invariably follows her own laws. Those laws which regulate health and disease, the laws of life and death, are definite, and may be known to those who, *per fas et nefas*, are determined upon inquiry and research. Hitherto it has been

held, that premature or very early death among the human species, is a law of nature. Undoubtedly myriads of human beings have been cut off under two years of age, thus opening their eyes in life to close them in death—they have been destroyed upon the very threshold of existence. There are diseases which are peculiar to the infantile state, a great variety of which are of a very inflammatory character, and of course liable to be fatal. But are we to be told that our advances in the knowledge and treatment of disease does not afford us any power over the early mortality of our race? The thing will not bear discussion: we have every day proofs that knowledge is power. The Stoics, who used every effort to advance the importance of mind over matter, took an idea into their heads that man should bend his exertions to imitate and approach the immortal gods. They considered that the gods sustained not any infirmity; they therefore denied even pain to be an evil—they thought the gods wanted nothing. Thus they reasoned:—Let us, if we cannot annihilate our passions and wants, at least diminish them, that we may imitate the gods, who have neither passions nor wants. It did not occur to them, that by endeavouring to obtain a correct knowledge of the relation that one thing has to another thing, a knowledge of causation, of the invariable con-

junction of antecedent and consequent, would give them a nearer approach to that divine wisdom who established causation, and in whom there is no variableness, neither shadow of turning.

The varied power of aëriform fluids generated in various ways when introduced into the blood, have been described as greatly influencing our feelings, and giving a variety of sensations not easily to be classed under any generic term. Thus, among females of a high nervous irritability, sensations will be felt, and symptoms exhibited, which assume the varied character of fever, hysteria, and, in some instances, of an aberration of intellect: all the animal and vital functions are disordered, and it is as difficult to give a just character or definition of it, as it would be to depict the rays of light in the colours of the rainbow. A truly poisonous power is exerting its influence upon the brain, disturbing all its functions. Thus the patient or invalid, perhaps, at first, is simply uneasy, then restless: it is, however, a general uneasiness, and a general feeling of being ill. It does not appear that any particular spot or part of the body is the seat of local affection: it should seem that as the functions of the brain are primordially disturbed, the first symptoms are mental, and that through the mind the body suffers. A learned author has said, that it is a

proposition hazarded with great doubt, that a disease should be in the mind; in a proper moral sense, those disorders which are found in the mind, connected with bodily disease, having been considered as arising from some derangement of the bodily organs. This is a point we shall not discuss in this place. Along with this bodily uneasiness there is a mental restlessness; the patient has an incessant desire to change his place or position very often; the mind cannot long fix its attention upon one object, and it very frequently wanders from one subject to another. There is an actual inability of exercising the great powers of the mind; the power of perception, arrangement of ideas, memory, and of judgment, are greatly altered from their healthful state. It would, perhaps, be useless to enter into a physiological discussion as to the immediate causes of these symptoms; and indeed it would be very difficult to do so: experience demonstrates the existence both of the feelings and the symptoms. A far more rational inquiry it would be to explain and relieve them. We may, however, be permitted to say, that the malady may be considered as irregularly progressive, sometimes exhibiting its power by paroxysm, at other times apparently quiet: there is great dejection of spirits, anxiety of mind, difficulty of breathing, and sometimes a palpitation of the

heart: sometimes a sensation of a sudden despondency will occur, which can only feel relief from an effusion of tears. Yet these symptoms are considerably different from hysteria; that sensation of a ball arising in the throat, commonly denominated globus hystericus, is generally absent. Many of its symptoms would better accord, in some respects, with what occurs in hypochondriacs, yet with very considerable variation. The animal heat is very variable and uncertain, and it does appear to depend, in a great measure, upon the nature of the base of the poisonous fluids which is the exciting cause. A deathly coldness will exist, if a carbonaceous principle prevail in the compound; the functions of the stomach, and of the whole alimentary canal, are immediately changed into diseased action. The source of animal heat, and the principles upon which it is founded, will be detailed as we go along; but as the stomach and intestines are frequently so much disturbed in these cases, it is very often assumed as a cause, although it is but an effect or symptom; and as disordered functions seldom exist for any great length of time without producing some organic disease, dissection has afforded proof that the liver, spleen, pancreas, and sometimes the stomach, has suffered in the ravage of its action. In some cases, invalids are punished with severe

pain in the back and loins, which would seem, from its severity, described by patients, to partake of the character and feelings of that painful malady called *tic doloreux*. When it attaches to a membranous cavity, such as the stomach and intestines, spasms of a severe character often take place, even to so great a degree, as to cause clammy sweats, a pale, cadaverous face, with coldness of the extremities; yet this state of symptoms are widely different from either syncopy or apoplexy. In syncopy the action of the heart nearly ceases; in the case in question it palpitates and is irregular. In apoplexy there is an abolition of sense, and of all voluntary motion, with snoring: the difficulty of breathing, perhaps, is nearly equal in both cases; but the state of the pulse is widely different, and there is, in the case before us, an utter absence of a congestion of blood in the head, which is one principal feature of apoplexy. A polluted circulation of blood, we find by experience, has the power of fixing upon particular organs: thus, in the heart it may produce a paralysis of that organ, and instant death; in the brain, aberration of intellect, with paralysis of the extremities; in the liver and pancreas, a disordered state of the alimentary canal, with an inexplicable alternation of purging and costiveness. It has been before said, that the action

of all aëriform poisons absorbed into the blood first produces its effects upon the heart, and after upon various other parts of the animal economy. We have also said, that the heart is liable to be affected by the affections of the mind. Certain mental affections, operating through the brain, greatly influence its action, sometimes very suddenly increasing the force to a very great degree, and others as suddenly diminishing it. This subject is enveloped in great obscurity, and it were much to be wished that we possessed a much better history than we have at present, recording the effects produced on the heart by the affections of the mind. Nor would such a history, although very desirable, be without its difficulties, because those very affections would, to a certain extent, tend to destroy the capacity for observation in the patient himself, and who could be the only accurate historian of his own feelings: the observations of others, however accurate, must be very imperfect, because the effects themselves would clearly vary according to the degree of the cause, and the previous circumstances of the heart itself, and other concomitant causes.

We do not assimilate the effects of narcotic poisons, or medical agents, taken into the stomach, to that of the poison of aëriform fluids,

introduced into the blood itself—the effects are as different as are their causes: thus, digitales, opium, hydrocyanic acid, and many other compounds, either useful or deleterious to life, appear to act primarily on the brain, and do not, like the poisonous aëriform fluids, affect the heart through the medium of the organs of respiration. We surely need not attempt to prove, at this time of science, that the brain is the material organ of all the mental faculties: we are taught, by fatal experience, that mechanical causes, as well as chemical, disturb or annihilate its functions: thus, extravasation of blood into its medullary substance, or inflammation, will impair the mental powers; a blow on the head will take away the senses; and a teaspoonful of blood effused into certain parts of the base of the cranium, will both instantly and permanently destroy all the functions of life. Hence it follows, as a matter of certainty, that in the human species the place of sensation is the brain, and that the healthful function of the brain produces what we call the intellect, or mind, and understanding.

It has frequently been said, that in health, but more especially in disease, the senses deceive us. I will not combat the opinion; but it would appear that our senses require to be

corrected by the empire of the understanding. Nor has any language hitherto been sufficiently either copious or expressive as to explain, with any tolerable accuracy, our feelings or sensations. Those sensations which are received from other parts of the body than what are very commonly called the organs of the senses, are expressed by the term which we apply to the sensation received by the skin. When we say, for example, that we feel either hunger or thirst, although we say that we feel pain, yet the idea held in common is not that the pain is particularly attached to the skin, or other organs of the senses, but that it is in various parts of the human frame. Universal experience attributes hunger to a sensation of the stomach; the best informed physiologists are, however, clearly of opinion, that it is not an affection of the stomach, in any other way than by sympathy. Hunger seems rather to be an affection of the blood-vessels, or a desire to fill themselves, than any particular affection of the stomach itself. If hunger were originally an affection of the stomach, the appetite would surely not exceed the power of digestion; it would not defeat its own purposes, or go beyond its own resources. On the contrary, when the vessels are very full, there is very often no sort of appetite, although

the stomach is not in the least incapable of digesting a large quantity of food thrown into it, without the least inconvenience whatsoever. It is, therefore, properly contested, whether the sensation of hunger can, with propriety, be said to be an affection of the stomach; and if this sensation, about which nine-tenths of mankind entertain no doubt to be a most painful affection of the stomach—if this be founded in error, which is truly the case, it will go a great way to show how little reliance can be placed upon our sensations, as forming correct ideas upon other matters.

I am prepared also to show, that our other imperative sensation, so well known by the name of thirst, were we to be governed entirely by the impulse of feelings, we should say, and do say, that it is referable to the mouth fauces, and organs of deglutition; yet the truth will be found, that those sensations only exist here, through the inexplicable power of sympathy. Thirst has often been known to be very intense when the glands of the mouth have secreted their ordinary quantity of fluids, and when the membranes lining the inside of the mouth, with its numerous follicles, have been abundantly supplied with fluids Sometimes the membranes of the mouth will be perfectly moist, yet if a

large quantity of the watery parts of the blood be evaporated in the form of an insensible perspiration, escape from the skin in sweat, or by any other means thrown out, by any of the excretory organs, which commonly throw off watery fluids (as, for instance, in diabetes), great thirst is certain to ensue, although there does not appear to be any particular affection of the mouth. We cannot surely say that an affection of the mouth is the cause of the thirst; because the sensation may be quite as well produced by a simple want of water in a sufficient proportion in the blood-vessels; and thirst from this cause commonly produces a desire to drink, whether the mouth be disordered or not. It has also been observed, that the feeling of thirst may be considered, in some respects, as a matter of habit; for there certainly are some people who have never felt the sensation of thirst, and who, when they drink, do so from a sort of sympathy, but who certainly could live a long time without thinking of it, or suffering from the want of it. There are also other persons in whom thirst is often renewed, and become so strong as to make them drink from thirty to forty pints of liquid in twenty-four hours. In this respect great individual differences are observable, which afford proof that habit has

considerable share in the practice. A celebrated writer has defined thirst to be an internal sensation—an instinctive feeling; he says it belongs essentially to the organization, and admits of no explanation.

There is a fact, worthy of notice as connected with this subject, and seems intimately involved with the process of respiration—the absorption of aëriform fluids and the varied feelings arising out of it, which is, that in all the cavities of the human body, gases are liable to be produced, and, by a process so very instantaneous, as to perplex the mind in its endeavour to give an adequate explanation of its formation. The term flatulency is familiar to all; and when it is confined to the large cavities of the stomach and intestines, it has been conjectured to arise from a fermentation of the food, indigestion, &c. We know that gas is evolved by fermentation, which is a chemical change in the state of fluids. Indigestion is also a concomitant effect of flatulency, but certainly not the cause. This creation of gas, which, in some cases of hysteria in females, and hypochondriasis in males, is formed in such quantities as to be very distressing, is purely a process of the mental faculty; it is, in fact, a secretion. We all know, that although secretion is furnished by peculiar organs, such as glands,

mucous follicles, or membranous secreting surfaces, &c., that the whole process is greatly influenced by the function of the brain, and that it is a phenomenon, in the present state of our knowledge, inexplicable. We know that grief enables the lachrymal glands to separate, instantly and abundantly, a watery fluid from the blood, which we call tears, and which frequently is the safety valve by which it escapes, and the mind obtains relief. We know that the liver, under a certain mental stimulus, will form bile so abundantly, that it frequently goes on till it produces the death of the patient in a few hours. The kidneys also, under certain states of nervous excitement, will throw fluids in quantities so prodigious, that it very far exceeds all the fluid matter received into the stomach; it must, therefore, be drawn from the circulation. And such is found to be the fact, as it often runs on till the death of the patient. These circumstances premised, we have no hesitation in saying, that under peculiar morbid excitement of the nervous system, the process of secreting animal gas is inherent in the secreting organs themselves. Its formation is frequently very rapid and formidable; it therefore often causes very great agony for the time. By means of distention it escapes by every possible outlet; and fortunately it is

that it does so, or the invalid must undoubtedly perish. From analogy, I am also led to believe, that, as animal gases, of various bases and compounds, are secreted according to the nature of the nervous excitement, or of the secreting organs or surfaces, so also has the constitution a power of absorbing these gases into the blood, which, as they are produced by a morbid excitement, partake of the nature of a morbid poison, and do, in fact, when entering the blood-vessels, produce very calamitous results. Sensations are often felt which cannot be described; and as our sensations give birth to our ideas, which, as it were, grow out of them, they are the material products by which we think, judge, and act, and constitute the sanity or insanity of our intellect. Our healthful body and sound mind are, therefore, dependant upon a great variety of circumstances which are regarded as innoxious by the multitude; for it has pleased the Almighty Being to cause an organized material substance to be the medium of all the mental faculties, subject, therefore, to physiological and pathological laws; for the brain, and, through it, the mind, is stimulated to the exercise of all its varied affections and functions, not only by direct sensations, but also by ideas, and by that particular arrangement of

them which constitutes the memory and the judgment.

These several affections, *mutatis mutandis*, act in their own peculiar manner on the brain and nervous system; and, through one or the other of them, on some part, or the whole of the sanguiferous system. And as these emotions of the mind, acting through the brain, produce these and many other effects on different parts of the sanguiferous system, so that system itself reacts in a very powerful manner again on the brain. We know that perception is a primitive law of the organization itself, inscrutable in its nature, and, like digestion and the variation of the secretions, only to be known by its effects. We all know how very difficult it is for the imagination to explain the phenomena of thought, with the movements of matter, but we also know that such connexion exists. We are equally ignorant why certain aëriform fluids, when absorbed into the blood, become poisons. A great variety of facts,—the truth of which we never doubt, but of the proximate cause of which we are very ignorant,—fill us with wonder. Numerous facts and experiments have shown us that carbonated venous blood, if, by any means it find a passage into the arterial side of the circulation, is a deadly poison to the party,

striking, with a deathly palsy, every organ to which it gains admission. Whenever an organ has a peculiar function to perform, the vessels subservient to that function are distinct from those vessels destined to its nourishment and support. Thus, the lungs are not nourished by the blood that passes through them for the purpose of respiration, but have appropriate nutritive organs like other organs. Now the importance of a most perfect oxygenation of the blood, through the respiration, is evident to be essential to all warm-blooded animals;—it is connected with their nutritive fluids, and with the quantity and activity of their general functions, and more especially with that of muscular motion. Thus, the muscular and nervous tissues are, of all parts, the most abundantly supplied with blood;—thus birds, who consume an amazing quantity of air, are capable of much greater and of longer continued exertions than any of the other classes of warm-blooded creatures. The relation between respiration and muscular motion is very observable, even amongst individuals of the same species, the strongest animals having generally the largest chest; and we are all aware that more air is always consumed when great muscular exertion is used, than when at rest. The vitality of most reptiles is not so very closely dependant

on the quantity of air—their respiration is very imperfect; and although many of them, particularly of the class of serpents, are capable of very violent exertion, *per saltum*, yet if those exertions be continued, their efforts become less active, and they are soon exhausted. In all animals whose respiratory powers are ample, the divisions of the windpipe are very minute, and the air-cells, consequently, are very numerous; their aggregate surface is, perhaps, greater than their whole body. What can exhibit a more beautiful cellular, or spongy structure, than the human lungs? On the contrary, in the cold-blooded animals the lungs are vascular, consisting of much larger divisions, and affording a surface proportionably much smaller for the contact of the atmosphere. The respiratory organs of insects are diffused through every part of their body; they communicate with the external atmosphere through the trachea, which opens on each side of the animal at the several joints of the abdomen. If any of those orifices be stopped with oil, the parts which they supply with air become paralytic, and the insect dies. The importance of respiration, as a vital function, was justly rated by the ancients. The language of antiquity is strongly tinctured with a philosophy, in which air and combustion forms

a prominent part. They had observed the analogy between the respiration and the flame of burning materials; and they also early observed, that the presence of air was necessary to combustion. The ancients simply observed a variety of facts, but did not attempt, like the moderns, to give definite causes for the phenomena that they saw. Later experimentalists have been rather too presumptuous in attempting to account for everything by the laws of chemical action, without sufficiently taking into the account that the vital principle exerts its living power over all the animal fluids, and governs that inscrutable process of secretion which cannot be brought to acknowledge any laws of chemical action.

We must not end our remarks upon respiration, and its effects, without taking notice of the series of phenomena relating to the temperature of the human body. This also has been, like many other appearances, sought to be accounted for and explained, upon the principles of the modern chemical schools, without much reference to those vital laws upon which all animal functions depend. All living beings have a prescribed range of temperature, within which alone they can perform their functions. The temperature of warm-blooded animals seems

very much to depend upon the quantity of air absorbed into the blood by the process of respiration: heat and carbon seem to have but little affinity: heat unites with the carbonaceous principle with great reluctance. Thus, wherever there be a great proportion of the carbon, there is but little heat, and *vice versâ*. Now the blood which is carried through the lungs by the pulmonary arteries, is highly carbonated by its circulation through the body, and consequently it follows that it has a less disposition to combine with heat; while the blood in the pulmonary veins, having lost this carbonaceous principle, by that means, possesses a stronger attraction for heat. Thus the source of the heat is the air, as we are able to evince every day, in a common fire, when the more air that is admitted the more rapidly it burns; and, on the contrary, where the air is excluded, combustion ceases. This air, then, is taken into the lungs at the time of respiration. Pure air, as was before said, is a compound of oxygen and caloric: here, then, we see that the heat, being in a combined state, is not sensible. The blood, in passing through the pulmonary arteries, parts with its carbonaceous principle, which unites with the oxygen of the pure air, and forms fixed air; while the blood in the veins, having its attraction for heat

increased, readily absorbs the heat thus set at liberty. Now it may be asked, by what means do the veins absorb the caloric? To this we answer, by open bibulous mouths; as we know that the same process is the economy of the veins in other parts of the body, it is certainly fair to suppose a similar structure here. Though such structure may elude our research, we certainly ought not, merely on that account, to conclude that it does not exist; yet it does not appear by what means the heat becomes sensible in the body. If the human frame be heated by arterial blood, it seems that something is wanting to decompose that blood, and to make it give out its heat in a sensible form: this process appears to take place in the small vessels where the blood becomes carbonated, and consequently has its attraction for heat diminished. Thus we see the heat is set at liberty, and diffused among the surrounding parts, as the small vessels are ramifying in every part of the body: the heat has, therefore, an endless surface to which it is exposed. Thus, as air is the source of heat, we should be apt to conclude that the temperature would be in proportion to the quantity of blood, as the larger the quantity of blood exposed, the more heat is absorbed in the lungs; but this does not appear to be conformable to facts, at

least, not without many cases of exception. As all animal heat is produced by respiration, it follows that animals, whose air-cells are small, and of course more frequently replenished, will be of a higher temperature than those whose air-cells are larger; and in this we find the predictions of theory confirmed by experience: thus, vipers and adders, and most reptiles of that class, whose air-cells are very large, partaking rather of the vesicular than the cellular character, their temperature is but little, comparatively to the atmosphere in which they live; while in dogs, whose air-cells are small and very numerous, their temperature is always high, as compared with the atmosphere in which they live. This principle, which is as curious as important to understand, may be illustrated throughout all nature. Frogs are found at an animal heat of 61, when the temperature is 57. Also in newts, whose lungs can be hardly considered in any other character than as a single bag or bladder, the animal heat was 54½, when the temperature was 52: in snails the principle is still farther illustrated. In fish also, as in eels, whose element is naturally cold, the animal heat was found at 59 in water of 57. In a leech, in an atmosphere of 53, the animal heat was found to be scarcely 54. The circulation in these

animals is also found to differ very materially from the human subject, as has been before observed. It is a very curious circumstance, that the standard temperature of the human body is the same both in summer and in winter, in cold as in warm climates; though there is no doubt that the temperature of the air differs materially in different seasons and in different situations. We have before explained the cause of the curious fact of nature, viz. that as the heat in the blood is in a state of combination, it consequently bears no relation to the temperature. Thus, reasoning is confirmed by experiment, that the quantity of caloric is variable, and exactly corresponds with the necessity of the case; and that cold air contains a larger quantity of the matter of caloric than hot air.—For instance: cold air is less rarified and more condensed; and next, it contains more of the carbonaceous principle. Now, although carbon has no affinity to heat in itself, by its combination it causes its developement. Ought we not to look with great admiration to the great First Cause, who combines principles to produce certain results, and adapts means to ends with such wonderful accuracy? It must be most pleasing to that Almighty Power, to observe creatures, whom he hath formed,

employing that reason with which his goodness has endowed them, in the pursuit of truth and the practice of virtue. We have said, that the source of heat is pure air; but to procure it, it is necessary to decompose this pure air; and this is effected in the lungs by the carbonaceous principle, which, by combining with the oxygen of the vital air, forms a carbonic acid gas; while the heat, escaping, combines with the blood. Were we, by the way of corollary, to condense what we have said, it would amount to this:—that heat was imparted to the body by the decomposition of pure air, by means of the carbonaceous principle; and that the heat set at liberty by such decomposition, is absorbed by the open bibulous mouths of veins; while the oxygen, uniting with the carbonaceous principle, forms fixed air. The quantity of pure air consumed by animal life is immeasurably large; even a small animal will decompose a gallon in a very short space of time. When we reflect on the number of animals, as well as fires, that are constantly consuming the pure air, it should seem wonderful that the atmosphere is able to support the consumption; yet the atmosphere does not appear less salubrious than heretofore. Now, as the atmosphere is known to extend only a few miles around the

surface of the earth, there must be some specific cause that this purity is preserved. There can be no doubt, but that this was a question which must frequently have occurred to philosophers, both ancient and modern; but it was reserved by Providence for the persecuted Joseph Priestley to explain to an admiring world the principles upon which its purity is preserved. He exposed in a receiver, containing impure air, a sprig of mint: he observed that, so far from this impure air being unfavourable to vegetation, it certainly improved the growth of the plant; and, on examining the air after this process, he found it completely purified. Hence, vegetation seems designed by nature as a counterpoise to respiration; and, in the following manner, it appears that pure air, by respiration, is converted into fixed air, or carbonic acid gas; while, in vegetation, it is probable that the fixed air is decomposed, and the carbonaceous principle absorbed; or, possibly, the vegetable may absorb the whole of the fixed air, and give a part of it out pure air. We know that vegetables, as well as animals, are organized bodies: they have their sap-vessels, and their air-vessels; therefore they may possibly take up as pabulum, what to us is useless, or even noxious. Thus we discover how beautifully nature has made

two parts of the creation subservient to the other. Perhaps, another source of pure air arises from the decomposition of water by vegetables: but it has been ascertained by experiment, that it is only when light is admitted to vegetables, that there is any amelioration in the state of the air; for in the absence of light the air is rendered more impure. Thus it appears that light must be considered as a means of purifying the atmosphere, as well as being necessary to vegetation: thus light, heat, clearness of thought. calmness and correctness of mind, as well as muscular motion, are all, in some degree, dependent upon the healthful state of the lungs, and the process of respiration.

CHAPTER X.

Breakfast.—The different Qualities of Coffee, Tea, Chocolate, Cocoa, &c.—Effects upon the Stomach and Digestive Function.

The stomach having been in a quiescent state during the process of sleep, begins again to feel the necessity of being supplied with its necessary sustenance, upon which to exert its power. The character of the feelings of an invalid require that the stomach should not be provoked to an action beyond its strength; and various articles of food have been suggested, by different writers, as of more or less salubrity, to be adopted, to the exclusion of others. Less regard is necessary to persons in health respecting the articles of diet, as well for breakfast as for other meals; and the taste of such persons may be indulged with little probability of doing harm, because healthy digestion has the power of producing nutritive chyle from varied and heterogeneous substances: but to the

invalid, whose restorative powers may be presumed to partake of the nature of the illness under which he labours, it is of considerable advantage so to conciliate the stomach to the nutriment received, that no additional inconvenience may be sustained by the sufferer from that cause.

With respect to coffee, our first article, the opinions concerning its properties are almost as various as the colours of the rainbow. Its general effect upon the nervous coat of the stomach is, unquestionably, a gentle stimulant; and, as most substances of that class, has, to a certain extent, a tonic power, I do not hesitate to recommend it to those invalids whose powers of digestion have been debilitated by stimulants of a more powerful character, such as fermented liquors, wine, spirits, &c. The custom, however, of taking coffee after a late dinner, for instance, and just before retirement to rest, is bad; because its stimulant property upon the nerves of the stomach exerts a power destructive to sleep—it promotes an activity to the mind, and gives a range to the imagination which prevents self-forgetfulness, that sure harbinger of repose.

With respect to the article of tea, our ancestors certainly did very well without it; they

enjoyed good health, and, in all probability, lived both as happy and as long, before this plant was brought from the remotest part of the earth for our accommodation. It is, indeed, a most powerful instance of the influence both of fashion and habit, that this plant should have taken such firm hold of the opinions and feelings of the people of the western part of Europe, and most especially of England. The Government of the country, much to its credit, has taken advantage of the mania, and made it contribute very largely to the national revenue.

There are two kinds of tea imported into this country—denominated black and green; and a very common opinion has prevailed, that it is the same plant, varied in colour by being dried, the one upon iron sheets, the other upon copper. This is, however, a vulgar error, as the plants are certainly very different. No quack medicine has had more numerous advocates than the tea-plant; it has been extolled to the skies, as it is probable most articles will be, that carry so high a duty in proportion to the intrinsic value of the article itself. The Americans, whose China trade is not under the monopoly of an East India Company, do not discover such amazing salubrious properties in tea: nor is the American Government enabled to inspire the

people with such enthusiasm, of which they might take advantage. With regard to the qualities of the plant itself, its general operation is doubtless both astringent and narcotic. I believe, also, it has both a stimulant and a sudorific power. But the constitutions of different persons have a great latitude in this particular: in some cases a cup of tea, particularly green tea, will throw the whole nervous system into very great disorder,—exerting a stimulant power bordering upon phrenzy. On the other hand, there have been cases where its narcotic power upon the system has been most alarming. In its general operation, its universal reception must prove that it is a beverage very agreeable, and, to persons in health, perhaps harmless. But I should certainly advise our invalid to be sparing of its use, at least until he has experienced its effects. If the introducton of tea into Europe has had the effect of producing a less desire for intoxicating liquors, which is the opinion of many, this is a recommendation of which I should be very sorry to deprive it of the full credit. The quantity of sugar that is used by the tea-drinkers is certainly injurious to the stomach, and ought to be cautiously avoided by every person in a valetudinarian state.

Chocolate and cocoa may be classed together:

they are very nutritious, and it requires strong powers of digestion to receive them with impunity; and as a very importunate symptom with most invalids is a disordered function of the stomach, I would most decidedly advise them to be very cautious of the use of either. As the oil is very abundant, the difficulty of effecting perfect assimilation must be very great. I well remember the case of a patient, who was gradually recovering from a regular continued fever: a perfect crisis had occurred, and the appetite was beginning to develope itself, when some wiseacre of a friend, as she was called, sent a present of chocolate, with a strong recommendation of its many very excellent properties; and, among the rest, of its being so very strengthening. The patient yielded to the suggestion, a relapse of the fever took place, and the sufferer narrowly escaped with life. I have a very excellent opinion of whey as a common beverage for invalids, and I am very much disposed to think that its use would be attended with less inconvenience than many of the other diluents that are taken; for breakfast it seems well suited, on other accounts. Butter is so very changeable an article in its qualities, and it passes so readily into a putrescent, or a rancid state, that dry toast, or biscuit, would suit much better the stomach

of invalids. An egg, not much boiled, is not objectionable; but eggs boiled hard must not be tasted. Bread and boiled milk is a very famous breakfast for those who are constantly out in the open air, and are using much exercise; but to an invalid it will not do, as it frequently forms a hard coagulation in the stomach, and is then very difficult to digest.

CHAPTER XI.

Dinner.—The different kinds of Food considered, in relation to the Invalid State.—Farinaceous and Animal.—Beef, Mutton, Veal, Lamb, Fish, Poultry, &c. examined.

THE dinner-meal ought to be the most substantial supply the system should receive in the course of the day; and it is in modern times, and in large cities, made a source of luxurious festivity to a person in health. Roast beef and roast mutton is the most eligible of all food for this meal. But to persons in an invalid state this must be liable to certain exceptions: there are few persons who are ill, who have not the stomach and digestive functions much affected; and it would not promote either health or comfort, to throw a burthen upon the digestive process, which cannot be sustained. The proper time of the day for the dinner of invalids should be early—at all events, not later than two o'clock in the afternoon; later hours would be attended with much exhaustion, and a greater depression

of the digestive power. Unless our invalid have suffered debility from evacuations, I am of opinion, that the functions of the stomach would be more easily accommodated to farinaceous than to animal food. That vegetable and farinaceous substances are perfectly conducive to muscular power, we have sufficient evidence; the lower orders of the Irish, for instance, consume, comparatively, a very small proportion of animal food, and there are no men capable of greater or longer continued muscular exertion. Many animals, constituted by nature to subsist upon vegetables only (the elephant, for example), are capable of amazing exertion and power. We must, perhaps, regard animal food, in relation to the invalid state, more in the character of a simple stimulant upon the vascular system, than as a tonic acting upon the nervous tissue. Veal and lamb are both of them improper for the valetudinarian state, upon this principle—they are more indigestible, and not easily assimilated to nourishment. It is most true, that young animals, not yet arrived to perfection, are unwholesome; and although some people in health have stomachs so strong that they can digest any food, yet to an invalid it is very hurtful. Food in which the nourishing properties are highly concentrated,

is not proper for the stomach of an invalid. Fish, in order to be preserved fresh for the market, are allowed to linger and die, instead of being put to death in health, as every living thing intended for food ought to be; and this circumstance very much alters its nature and properties as food; and probably is one cause why, with some people, fish is said to disagree, by exciting disturbance in the alimentary canal. It is less nutritive than the flesh of warm-blooded animals, and of course is less stimulant to the circulation. Where the complaint is attended with febrile excitement, fish is more proper than flesh; and in all cases where the digestive powers are sunk, it is proper, as being easily converted into chyle. Fish, in proportion to its bulk, may be said to be almost all muscle; and you may readily know if it be in high perfection, by the layer of curdy matter interposed between its flakes. It often happens that those parts of fish, viz. the pulpy, gelatinous, or glutinous, which are considered the most delicious, are the most indigestible, and unfit for the stomach of an invalid. Lobster sauce is a very bad addendum; the best accompaniment is vinegar. Most shell fish are very indigestible, and, from the indisposition caused occasionally by eating them, the idea of their being poisonous

has been created. Oysters, when eaten in large quantities, often cause great disturbance: shrimps and muscles have produced death; but whether from their indigestibility or poisonous quality, I cannot determine.

Thus much with respect to fish, as food for invalids, in which it would appear that it would be safer to avoid shell fish altogether. But it is less stimulating, even when perfectly digested, than animal food, or the farina of vegetables. It is, perhaps, but of little practical importance to know whether fish produce its mischief by a specific poison, or whether its effects are caused by its indigestibility; for, whatever is incapable of being properly decomposed by the living action of the stomach, may, in effect, be considered as poisonous, as it will excite a derangement in the functions of the intestinal canal, and, if excessive, would be likely to prove fatal. It may be here proper to notice, that in regard to many articles of food, the old adage may, in some degree, be said to be verified, viz. "That what is food for one shall be poison to another." The stomach has its peculiar disposition, like other organs; and when persons are in health, it may, perhaps, be allowed to be a good instinctive guide; for very seldom what is desired with great earnestness, is found to be a source of alimentary disturbance. I once lost all hope of

recovering a patient in *cholera morbus*, when he declared he would eat as many broiled rashers of bacon as he could swallow before he died. The sickness and evacuation at this moment were dreadful: he insisted upon the bacon, and he ate no less than half a pound of bacon, cut in thin slices, and broiled on a gridiron. He ate them voraciously: the sickness ceased, and the purging too; and from that moment he dates his recovery. Now he thinks every body may be cured of a similar complaint, if they will take, like him, rashers of bacon: this, of course, is absurd.

With poultry I shall not have much to say: it is light, and easy of digestion, but there is very little nourishment in it in proportion to quantity. Most of the white meats are detained a considerable time in the stomach, and furnish but a moderately stimulant chyle; yet it is so far objectionable, that it is likely to go into a state of acetous fermentation. It may be useful in all cases where there is a high state of vascular excitement, and where more stimulant food would be very hurtful.

I shall now notice as food the farina of wheat. The grain of wheat is provided with a case, or cortical part, which, if swallowed in an unbroken state, would pass through the alimentary canal unchanged, and without affording any nourishment to the system. Wheat has

more gluten in its composition than either barley, rye, or oats; and which is the chief reason of the preference given to it in the formation of that most valuable necessary of life, named bread. This staff of life, when pure, is very salubrious, but it is liable to great abuse from the avarice of mankind. Pure wheaten bread is very nutritive, tonic, astringent, and of easy digestion. The alum and potatoes, with which it is plentifully mixed, is a great evil to an invalid, because it leaves him not only in a state of uncertainty as to what is the food he is taking, but likewise as to the cause of the particular effects that are produced. Newly baked bread is universally known to be improper to be eaten, because it swells like a sponge in the stomach. It is very indigestible. A too great proportion of bread food produces heartburn and acidity. A physician of celebrity asserts, that it gives children a pale countenance, and breeds worms. He also says that all pastry is an abomination; and he thinks that one half, at least, of the cases of indigestion which occur after dinner parties, may be traced to this cause. There is no doubt of the fact; but perhaps it may be principally occasioned by the admixture of butter, which, although good to the eye, may yet be advanced to a state bordering upon rancidity or putrescence.

CHAPTER XII.

The subject of Supper considered.—Late Suppers to be avoided: mostly injurious to Invalids.—Animal Food to be superseded by any light Diet, of easy Digestion.—Indigestible Matter in the Stomach the cause of nervous Irritation, Restlessness, and want of Refreshment from Sleep.

We have generally suggested in this Manual, the superior advantages of abstinence, in regard to health, when held in comparison with repletion; but it is more especially applicable to the meal commonly termed supper, as it is attended with consequences the more important, because there is an absence of the exertion of muscular motion, which often acts as a safety-valve in preventing the evil effects of intemperance.

These observations were premised, from a conviction on the part of the author, that the evils of late (and what are commonly called

hearty) suppers, are but very imperfectly known. Effects are constantly attributed to wrong causes: we are continually bribing our judgment to justify our inclinations. In a great proportion of the sudden deaths which are continually happening, two-thirds, at least, are found dead in their bed in the morning. In these cases, the victim is prevented from relating a detail of the sufferings, or his opinion of their cause: but a large portion of cases of gout, asthma, hæmorrhoids, apoplexy, and many other diseases, may be fairly attributed to late and hearty suppers; for they happen very often among that class of persons who give themselves this indulgence. It has been more than once mentioned in these pages, how very much the process of digestion and chylification depended upon the vigorous and healthful function of the brain. Can a gorged stomach, at bedtime, be wholesome, when there is an absence of all intellectual energy to carry on the function of digestion? In the reign of the Tudors, the nobility and the gentry of England were accustomed to take dinner at twelve, and to sup at six in the evening, and to retire to rest about nine. That our ancestors were great supper eaters, and, perhaps, with impunity, is very probable, as we perceive it was under

circumstances that prevented any bad consequences resulting from it. In our former discussion concerning digestion and chylification, every argument employed will illustrate the folly of indulging in hearty suppers; because it was clearly shown, that the three most important processes—of digestion, chylification, and sanguification, required the activity of the muscles as a kind of outlet for the abundant stimulus that was by those means produced; besides, sleep is confessedly unfavourable to almost every stage of digestion: going to bed with a full stomach must be peculiarly hurtful to a person in health—much more prejudicial to the invalid. It also gives occasion to that most painful affection called spasm; and if it should attack with severity an organ whose functions are essential to life, it will instantly destroy. The system of making repletion the basis of consolidating or perpetuating of friendship is most absurd; yet nothing is more common, in order to obtain the character of being a friendly and social fellow. You are required to sacrifice your understanding, and to make your very existence the pledge of your sincerity. The influence of a supply of food upon the animal economy, is most extensive. Forming our opinions simply from our feelings,

it is allowed to be exhilarating and comfortable; but an unseasonable, irregular, stimulus of this kind, is a very frequent source of functional disturbance. The stimulus of nourishment acts upon the system not merely by the quantity, or even the quality, of the fluids which enter the thoracic duct, but also by an inexplicable impulse which the stomach receives; and as the great organ or centre of sympathy, it propagates its effects over the whole animal economy. We have a remarkable instance of its sudden and quick operation in cases of great fatigue or exhaustion; when the faint, uneasy sensations, are almost instantly relieved, before the deglutition of the first morsels can have given any supply to the circulating fluids.

It is no argument in favour of late or hearty suppers, to adduce instances of individuals having allowed themselves this indulgence for many years, without any apparent injury to their health; for, independently of the received principle, that to every general rule there must be some exceptions, we know the force of habit will change the natural and relative bearings of things;—for instance, almost every person who has reached an advanced period of life, has made many dietetic discoveries relative to himself, which would not be allowed in reference to

others. Some people, who pay considerable attention to this subject, have associated in their minds a sort of catalogue of dietetic substances, which, though generally wholesome to themselves, are often sources of inconvenience and sickness to others; take, for example, fat meat, which, in a powerful stomach, fully equal to its digestion, is a wholesome and nutritious food. But the same food, in persons whose digestive organs are feeble and irritable, is a frequent cause of heartburn, sickness, and vomiting, with a great variety of other inconveniences. Also, in cases of fever, nothing is more usual than for the friends of patients to throw out insinuations that the patient will die of exhaustion on account of the inability to take food; and the practitioner is frequently under considerable embarrassment to explain the folly of the measure to their satisfaction. And when the principle has been violated, and food has been taken, under circumstances of fever, it has always been followed by an exacerbation of the paroxysm, a protracted crisis, with much derangement in the circulating system, flushed countenance, and often intense head-ache; and not unfrequently does it happen, that a physician, acting upon the most judicious principles for the safety of his patient, has to

contend with ignorance and calumny as a reward for his pains. His reputation will probably be estimated by the result; and there is, perhaps, no profession where the advantages are so very inadequate to the risk of detriment, in fortune or in fame: for accident will often accomplish what merit strives for in vain; and those coincidences of circumstances which frequently elevate one man and depress another, in the healing art, is more the production of what is commonly called chance, than from any extension of mind, or any peculiar tact or skill in the art of intellectual combinations.

It has been recommended to take no animal food for supper; and most certainly, for an invalid, such food is very improper; for, in almost all cases, the valetudinarian has a pulse much above par, and the quantity of animal gluten which it contains, must, of necessity, throw an injurious stimulus into the system, which is a cause of an accumulation of high irritability. Light farinaceous food, well fermented, and well baked, is the only supper, in a state of ill health, which can be taken without mischief; because such food does not give a weak stomach much trouble to digest; nor does it occasion an excess of stimulus beyond the irritability. If we introduce any substances of an indigestible character into the

stomach, all the animal functions immediately sympathize with the suffering organ; and a train of symptoms are formed, which it will be found no very easy matter to manage,—a peculiar species of what is called nervous irritation takes place, the mind is disturbed equally with the body, altered perceptions give occasion to gloomy and melancholy thoughts, a general restlessness is produced, and, as a natural consequence, all the restorative powers of sleep are chased away; nor can you possibly discover any substitute for nature's sweet restorer. In respect to the quality of refreshment from sleep, all the medicines given as sedatives, will prove but a very indifferent *succedaneum*. Opium, to which invalids often fly for relief, is a medicine that, if possible, should be very seldom used for the mere purpose of producing sleep, in cases unattended with other symptoms than those which arise from derangement of the digestive organs: and in nine cases out of ten, the invalids who are able to walk about, visit, dine, &c., will find the seat of their complaints in the deranged functions of their digestion. Opium is an able operative in the hands of a skilful physician, but a very dangerous one with those who are rather pleased with its power than acquainted with its virtues. Its great evil is

its tendency to produce costiveness. A light supper, of easy digestion, no meat, and an early retirement to rest, give the best promise of repose upon the pillow, and the best security that you will awake with renovated powers, and rise like a giant refreshed, in the morning.

CHAPTER XIII.

The Science of Chemistry recommended as a Study to the Invalid, a Pursuit both entertaining and instructive;—enters every Composition employed as Dietetics, and of Medicine;—of most essential Service in obtaining a Knowledge of factitious Airs;—useful in leading the Judgment to a right Knowledge of Symptoms in Disease.

THE leading feature of the purpose of this Manual, has been to elucidate in what manner the mind, or, in other words, the irregular functions of the brain, disturb the healthy actions of the animal economy. It has been asserted that every person who is comparatively happy, is also in a state of health corresponding with this ratio. A person whose mind is in a state of high susceptibility requires a corresponding excitement to produce sensation, *or the mind will shake the edifice of its own structure, by the creation of false perceptions.* An indefinite, but highly interesting mental

stimulus, is a most essential agent, or remedy, in the curative process of the health of an invalid, and even in chronic, or organic disease, it is also not without its use; I therefore rank the science of the laws of chemical agents as an important instrument in the production of health. The almost infinite variety of its products will astonish and delight; its close alliance with natural history will render it very interesting; while its practical operation enters into most of the combinations which give elegance to almost all the embellishments of life; its utility is no less evident to the perfectibility of the arts and of professions; it gives value and dignity to the character of man, as a member of civilized society.

Without a knowledge of chemistry the principles of vegetation and of agriculture could never be called into operation in a manner so as fully to develope the fertility of the earth; even the nature of loam, and of manure, would have remained unknown. This science assures us, that the earth has an analogy to an animal body; it requires rest, it must occasionally lie fallow; it also requires nutriment to call forth its productive energies, and this it obtains from the manure that is spread by provident agriculturists, with a bountiful hand, over its surface,

It affords us the means of ascertaining many of the phenomena which are intimately connected with vegetable life; it enables us to understand many of the diseases to which vegetation is subject, and the nature of the death to which, in common with all organised bodies, it must submit. The sap of the vegetable, which is its vital fluid, has been subject to analysis, and its varieties and specific properties ascertained; the laws of attraction, gravitation, electricity, magnetism, hydraulics, and hydrostatics, all unite with chemical science in explaining the wonderful laws of the vegetable world.

Can it be said that, under various interesting employments of the mind, the invalid is not consulting his restoration to health, in turning his attention to the beautiful philosophical phenomena of chemical science? Without it he cannot even understand the process by which his food sustains his strength, nor the manner of remedies employed as curative agents, in affording him relief when afflicted with disease. It is a science which investigates the composition of material substances, and the permanent changes of constitution which their mutual actions produce. It is a branch of natural philosophy which unfolds the nature of all material bodies, determines the number and properties of their

component parts, and teaches us how those parts are united, and by what means they may be separated and re-combined. It would, perhaps, not be too much to say, that the objects to which the scientific chemist is directed, comprehend the whole of the substances which compose the habitable globe. It explains the nature of salutary processes; it detects, and subjects to analysis, deleterious agents, and shows in what way its powers may be either eluded or destroyed.

The health of all persons is so deeply implicated, in relation to the application of any poisonous fluids to the body, through the medium of touch, which constitutes what is familiarly termed contagion, or through another medium equally important, viz. the air-cells of the lungs, received in their gaseous form, and absorbed into the blood, which is termed infection, that a science which has reduced to certain properties these hurtful agents, must rank as of primordial importance. By chemistry may be analysed all those subtile particles arising from putrid substances, and also those evanescent fluids which escape from persons labouring under certain diseases, and by means of which the disease infects others. Thus the miasma of bogs and fens, the vapour and effluvia of dead animal and vegetable substances, the fumes of these, and

many other destructive poisons, are now many of them well known, and to some of them re-agents have been discovered, destroying their pestilential character.

By a knowledge of chemistry we have under controul one of the most horrible and destructive of all morbid poisons. The properties of a metal acted upon by the agency of fire neutralizes this virus, and extinguishes the disease. It is not to be understood that we have a perfect chemical knowledge of all the various poisonous effluvia, but we know that they are formed by certain proportions of hydrogen in union and combination with sulphur, phosphorus, carbon, and azote, and that the only proper antidotes, or destroyers of these gasiform poisons, are nitric acid vapour, muriatic acid gas, and chlorine: the two last named are very efficacious, and it is to the study of this most delightful science that we have obtained a knowledge of these re-agents, which, in their practical effects, may be said to restore patients from the verge of the grave. A knowledge of the specification of most of the vegetable narcotic poisons leads us, by the same ratio, to adopt remedial measures, and often to restore animation, to all human appearances gone for ever.

The nature of combustion, to a philosophic

inquirer, affords an almost infinite variety of phenomena, as yet not sufficiently understood. It is, however, well ascertained that flame is caused by the consumption or absorption of oxygen gas, and this is illustrated by an experiment; for the oxygen gas that has been absorbed by the flame of the burning body, may be reproduced, or recovered from the created compound; and it is curious to observe, that the weight of the air regained will be equal to that which was lost during the combustion. Chemical experiment has demonstrated, that air, in which a body has been burnt, is by that process rendered unfit for the continuance of combustion, or for the important function of sustaining animal life. The process of detonation is occasioned by the union of oxygen and hydrogen; a great impulse is given to the surrounding air; the detonating substances occupy much less space before the inflammable process, and the sound is caused by the rush of air to occupy the vacuum.

The wonders of magnetism, electricity, &c. is well adapted to evolve all the mental energies, and to create or excite a principle of curiosity sufficient to induce us to become acquainted with many of its very varied phenomena. The ancients first found out some of its more obvious properties in amber, and which, in their idiom,

was called *electrum;* and hence arose the term electricity, which is continued in our times. The simple facts of electricity are highly entertaining in their own nature, without any reference to the many objects of practical utility to which it may be rendered subservient. Thus, if we rub a piece of sealing wax and a dry warm flannel together, we shall discover that they become, by the process of friction, capable both of attracting and repelling light bodies. A dry and warm sheet of common writing paper, rubbed upon Indian rubber, or a glass tube rubbed upon silk, exhibit the same curious phenomena. Various experiments, illustrating the principles of electric attraction and repulsion, might be here detailed; but it is not to our purpose, further than to observe, that a mind absorbed with the beauties and wonders of chemistry, has little occasion, and probably will feel but small inclination, to create to itself fictitious alarms, or give cause to the formation of fastidious sensations, alike destructive both of health of body and peace of mind.

This science informs us of the peculiar qualities of factitious airs, and of their specific and particular effect upon the various structures of the animal economy. The various poisons of a vegetable or narcotic character, which produce

in many cases instant death, do not in every instance leave an alteration of structure, but act by a chemico-electric power upon the nerve, whose minute threads are expanded over mucous membranes, and produce an immediate sympathy with their common origin, the brain. The knowledge of the laws of chemistry greatly elucidate in this manner medical jurisprudence; it elucidates also the peculiar quality of poisonous gases, and the particular structures that are fatally affected by them; for instance, carbonic acid gas, is constantly taken into the stomach, in fermented fluids, such as champaigne, cider, Burton ale, soda-water, and a great variety of others, which could easily be named, with perfect impunity, and, in some instances, with considerable tonic effect. But let it be remembered, that it is this very gas, when taken in quantity into the air-cells of the lungs, which produces death, and leaves no traces of its ravage upon the living tissue. The deadly poison of the viper, or rattlesnake, can be swallowed with crumb-bread without injury; the power of the gastric secretion immediately acts as a chemical agent, and neutralizes its poison. Even the common purgative bitter extract, called aloes, although useful and medicinal to the human species, is a deadly poison

to dogs and wolves; and the author has been informed, by a very intelligent naturalist, that it is equally so to the tiger and to the lion. It is also certainly known to the medical philosopher, that the plant called water-fennel, or fine-leaved water-hemlock, will instantly destroy the horse; but oxen often devour it greedily, and with perfect impunity. Its mode of operation upon the horse is that of a direct sedative; it not only impairs, but destroys the function of the brain, and he dies very quickly. But by chemistry we discover that its properties of destruction are alcaline; and we find, by experience, that a strong solution of citric acid decomposes this deadly quality, and renders it harmless. And the different poisonous gases, such as hydrogen and azote, would doubtless be rendered inefficient by chemical agents, if their action were not so instantaneous as to preclude the use of any remedy. The hydrocyanic, or prussic acid, the essential oil of tobacco, and a great variety of other poisons of a vegetable kind, produce their fatal effects, without leaving any traces upon the organic structure: they act upon the functions of vital organs, and, according to their specific nature and properties, produce their certain effects, either of suffering, or, in the infliction of death, the extinction of all

suffering; and when such very important results may be, in a great measure, fully elucidated and known, by attention to the nature of chemical combination, and the salutary power of its agents, who, that has leisure, would hesitate to employ it in endeavouring to obtain a knowledge that can be rendered so very useful, as well as entertaining? We avoid going into a detail of the universality of its powers; it is known to destroy material products, and to create new substances from its ruins. The allwise Author of Nature has thought proper to produce most of the changes which his wisdom effects, on the earth we inhabit, and the atmosphere which surrounds us, by laws truly chemical: in proportion as we obtain a knowledge of the certain principles by which the Divine goodness regulates the relation that all organized beings have to each other; in that same proportion is humanity dignified, our usefulness and our happiness increased; and if, as it sometimes happens, that an increase of knowledge produceth sorrow, it is a sorrow that conforms the principle; because he who possesses much knowledge, is best convinced of his ignorance, and assured that ignorance and misery are terms nearly allied.

CHAPTER XIV.

The beneficial Effects of Early Rising—The State of the Pulse, as denoting greater Mental and Bodily Power in the Morning.

The old adage of rising with the sun, like many others of the same description, although used as a metaphor, is not without a reference to a rule of life, the observance of which has an influence upon health that is very remarkable. There can be no doubt but that the atmosphere most conformable to the expansion of the lungs, and the more perfect oxygenation of the blood, is that of the morning. After a state of repose, when all the voluntary muscles have for many hours been in a state of inaction, the heart is found to be more powerful, more regular, and more slow in its contractions, than at night, after the fatigue, the anxiety, and the irritable fidgety sensations accompanying the actions of laborious exertion during the day.

How the heart should possess a power of restoring its own energies, while its action continues, is one of those first principles which we know, but of its cause we remain as ignorant as we were when in the cradle.

The functions of the brain also are decidedly more perfect in the morning than at any subsequent part of the day; for the mind, while a man is asleep, is at rest, at least so far as regards the power of perception. Here, then, we perceive there are several concurring causes why an invalid, who wishes to obtain health, or others, who wish to preserve it, are directed to the morning as a most powerful auxiliary.

Upon the perfect function of the brain, which constitutes what we have denominated mental power, not only health, but even happiness itself, do greatly depend. All nervous irritation, all mental irritability, must be dispersed by that regular vascular excitement which takes place after a perfect night of repose. In a good sleep the action of the body, which makes impression on the mind, if not altogether at rest, is much more so than when the body is awake. When a person goes to sleep, he puts himself in a recumbent posture, which is not a posture he commonly assumes when awake. In this position he is supported by a great number more

points than when standing, sitting, or walking; therefore, more points being pressed upon, it requires less exertion to avoid the effects of such pressure. So far, therefore, the body may be said to be more at rest when asleep than when he is awake. A twelve or sixteen hours uninterrupted continuation of active exertion, causes such an impetuous strain of consumption, as produces a more violent pulse, a kind of general fever, commonly called an evening fever: sleep then comes to the relief of both the body and mind; and after seven or eight hours pause of this kind, the stream of vital consumption is so much checked, and what has been lost is so fully renewed, that pulsation, and all its other movements, are again performed, slowly and regularly, and the course of life proceeds in a healthful manner, as before.

Nothing, therefore, is able to waste and destroy us so soon as long-continued want of sleep. It has been broadly asserted, that even trees, whose duration is so far extended beyond animal life, would be utterly unable to continue their being, if it were not for the long inactivity and sleep during winter. Bellini gave us some very curious observations concerning the state of the pulse, as resulting from that tranquil feel, when every animal and mental function has been

repaired by sleep; and which, I contend, is only to be felt in its perfection in the morning. I have given a variety of reasons why the invalid should, if possible, take the advantage of the morning air, which is a time when every function, both animal and mental, is most perfect, and best calculated to convert the tonic power of the air into gentle excitement and pleasant feelings; for the exertions, both of body and mind, are daily much greater than could be supported for a continuance, were it not for those intervals of repose which they receive during sleep, and of which we have just spoken.

CHAPTER XV.

Illustration of the Nature and resuscitative Power of Sleep;—Quantity necessary for Health.

The nature of sleep itself has been variously considered. By some it has been held as a definite function, but as the term function is equal to action, it is most certainly an abuse of words to apply it to a state which consists in the negation of action. Sleep has, by others, been considered to be a venous plethora, or an accumulation of blood in the veinous vessels of the head. They draw this analogy from apoplexy, which is very imperfect; inasmuch as they compare a fatal disease "with tired nature's sweet restorer—balmy sleep." The beneficial effects of sleep, as a restorative process, are universally felt, and it would be only ingenuous to confess what is really the truth, that we are utterly ignorant of the physiology of this healthful function. The state of the circulation through the brain in sleep is not continued with

the same velocity as when awake. The heart continues its action when the man is asleep, but not with the same force; for the pulse, the measure of the heart's action, is neither so frequent, so full, nor so strong, as when he is awake; nor does the breathing go on so quickly; nor any of the other actions necessary for life. It would also appear, that sleep does not necessarily fall upon all the animal organs at the same moment of time. In sleep the judgment is often at rest—perhaps the memory and imagination also; the state of the body, which gives the mind a means of perception, is also, in most instances, totally at rest. Sleep, therefore, may be considered as a state of nervous quietude, during which all the animal and mental powers are recruited: it is, in truth, in the healthy subject, the most powerful tonic nature can command.

It is well known that a privation of sleep for any great length of time, will prevent the necessary accumulation of the powers of the body, and induce such a state of weakness that the system will become quite exhausted, and the party will perish, or a state of mania will be superinduced; in which it has been often observed, that little sleep is necessary to the existence of the unfortunate victim. It is a most curious fact of pathology, that animals can be

deprived of sleep to an amazing extent, without any effect upon their health or brain—even febrile action does not appear to be produced in some cases. If they have previously been fat, they lose a portion of their bulk, but they appear more muscular, and sustain no loss of their animal powers. Mania, or madness, as an affection of the mind, although so common a calamity to the human species, does not affect animals; at least we have no evidence to prove that it does. The circumstance of hydrophobia being a specific malady, and capable of communication by a specific infection, is no exception to the observation just made.

People should remember that our place of repose should be quiet, easy of access, and obscure. The less our senses are acted upon by external impressions, the more perfect will be our rest. Through sleep we may be said to be daily reborn, we pass every morn through a state of temporary annihilation into a new and a refreshed life. The alternations of labour and rest are, therefore, blessings bestowed upon us by the all-wise Benefactor of all living beings; for without this continual change, this incessant renovation, how wretched would our condition be, and how depressed every mental and physical feeling! Take from us hope and sleep, and

nothing of value would remain. The quantity of sleep necessary to preserve health, is certainly very different in various persons; perhaps, as a general rule, it may be laid down that not less than six hours, nor more than eight, will answer the purposes of nature. Those are, therefore, very unwise, who imagine that, by taking as little sleep as possible, they either prolong, or render happy, their existence. They may, indeed, spend more hours with their eyes open, but they will never enjoy life in the proper sense of the term, nor that freshness and energy of the mind which are the certain consequences of sound and sufficient sleep, and which gives a character of decision on all our undertakings and actions; for nothing can be said to waste us so much before the time, and give us the early appearance of age, as the want of this restoration: it retards all the vital movements, collects the vital power, and completely restores what has been lost by exertion and fatigue in the course of the day; there is also an expurgation of what is hurtful. It is, as it were, a daily crisis, in which all the secretions are performed in their utmost perfection. From such a state we arise like a giant refreshed, to our work.

From the oldest times, the superior advantages of an early retirement to rest, and

an early rising in the morning, has been inculcated, not only by writers, but by a more unerring test, the general experience of mankind; yet the inconsistency of theory and practice is very remarkable:—we acknowledge what is right, and practise what is wrong.

> "Early to bed and early to rise,
> Will make us healthy, wealthy, and wise,"

is an old saw full of pith and truth. While patients are found so inconsistent, the practitioners of medicine must have much vexation. We are all subject to a great variety of diseases, and medical men, in order to cure or relieve them, study the art and science of medicine at great expense. All the preparatory studies of anatomy, physiology, and pathology, are pursued, the principles of relief are clearly explained and recommended; but so perverse are the views of many patients, that they adopt their own inclination, temper, and passions, in the choice of remedies, leaving to their medical adviser only responsibility in case of failure; while, if they do well in defiance of advice, they laugh at their doctor, and take the credit of the cure to themselves.

CHAPTER XVI.

Gymnasia—The various Modes of Exercise—The Passive Mode by Carriage—The Active Mode by Walking—Running—Horse-riding, &c.

In early times, the Greeks, who lived under a pure atmosphere, were convinced that a rational enjoyment of nature, and a continual exercise of their powers of body and mind, were the most certain means of consolidating their health, and of prolonging their life. Those readers who have had an opportunity of perusing the writings of Hippocrates, will soon be convinced that the physicians and the philosophers of that age knew no better method of attaining their end, than by moderation in diet, the free use of pure air, bathing, and, above all, by friction of the body, and by almost constant exercise. A particular art, called the gymnastic, arose, approved by the greatest philosophers and men of learning, who never forgot that both body and mind ought to be exercised in the same relative proportions. This art has been much neglected with us, partly

from the natural indolence of the human character, and partly from its prophylactic properties. It has but seldom been much encouraged by medical men, whose money interest has been rather to encourage disease than to prevent it. The ancients, however, suited exercise to the different constitutions, situations, and wants of man: they employed it, above all, as the means of keeping his internal nature in proper action—thus rendering the causes of diseases ineffectual, and proving a remedy to those already in existence. Every thing in nature may be said to be preserved in a proper state by action—even metals and minerals may be said to be in active state: indeed, it would appear that motion is essential to matter as well as to mind. The whole solar system is an illustration of this truth: the earth and all the planets keep their constant motions—the air is tossed by the winds—the waters are ebbing or flowing, no doubt to the preservation of their healthy state, affording us a useful lesson of the advantages of activity. The propensity to bodily movement is in man as great as that of eating and drinking. Let us only look at a child:—Sitting still is to it the greatest of all possible punishments, and inactivity and listlessness is a proof of an unnatural, if not of a diseased state.

Nothing tends to produce tranquil feelings, or to allay nervous irritation, so much as moderate exercise in the open air.

The influx of riches, and the general accommodations which it brings in its train, has made it very fashionable to adopt the passive mode of exercise, viz. the various vehicles of carriages. This may be very flattering to vanity; but, unless an invalid be very far sunk in debility, it is certainly not very conducive to health. The muscles of the human body have very little employment in carriage exercise, and (unless so far as air is concerned) carriage exercise is but little calculated to increase strength, which is principally wanted; for, in a great proportion of invalid cases, weakness is a very leading symptom. Exercise must always be suited to the powers of the patient: if a burthen be imposed beyond the capacity, weakness, not strength, will be the result. Moderate exercise after eating is found very much to assist and accelerate digestion, and to promote the absorption of chyle, upon which the restorative process greatly depends. Exercise, of all things, is most improper during a hard or an accelerated pulse. Neither inflammatory nor febrile actions will bear the stimulus of exertion without being attended with lassitude and fatigue: even the stimulus of a light

room, without any muscular exertion, has been known to be hurtful when the system is under a morbid excitement. This fact will admit of illustration by the operation of the mind itself upon the muscular power of the body. In a state of perfect health, when the animal functions are carried on with regularity, and all impressions upon the nervous system are of a pleasant character, producing an exhilarating effect, the muscular power is wonderfully increased simply by such feelings; the party is capable of undergoing exertion much longer, and much more severe, without lassitude and fatigue, than under an opposite state of things. Whenever the mind is under a state of depression from any cause, either real or imaginary, the muscular powers of the body immediately by sympathy partake of the impression, and a corresponding detraction from all the bodily energies is the consequence.

From the observations now detailed, this practical fact may be very naturally deduced, that all invalids, whose complaints arise, in a great measure, from mental, or what is commonly termed moral causes, are thereby prevented from employing much bodily exertion, from the wearisomeness that often succeeds. Carriage movement, or passive exertion, will be best suited to

their condition, until their powers be sufficiently recruited to afford more muscular efforts.

The active mode of exercise, as walking, running, horse-riding, &c., and every species of gymnastics, where the muscles of the body are frequently called into considerable action, are best suited to persons free from any local affection, either inflammatory or otherwise. Febrile excitement seems rather to be an affection of the whole system, than attached to any particular part; but it equally disqualifies a person from any desire for exertion, or the chance of deriving any benefit from it. Violent efforts are clearly improper, under any circumstances, as they produce a very great acceleration of blood through the brain and lungs, and may be productive of immediate death. Besides, where no such calamity happens, there is, in violent action, a large consumption of the vital power, with corresponding languor and dejection, alike injurious to health as aggravating to disease. Walking, or riding in the open air, both excellent in themselves, must always have a reference to the existing capacity of the party. Exercise should be carried to such an extent as to require the restorative power of sleep: when this is the case, the invalid will awake with greater capability; but when carried to the extent of great

fatigue, instead of rest come lassitude, *ennui*, and great nervous irritation; banishing sleep, and inducing languor and debility. Moderate exercise is principally to be recommended; and, if the liberty of choice, as to the time of the day, remain with the party, the morning is on every account to be chosen as the best.

With respect to dancing—a delightful employment among the young and the active—it is so very seductive an amusement, that, although capable of the greatest benefits, I am much disposed to think it is practically very liable to do harm. The exertions are often too violent, and much too long continued: the rapid circulation of the blood caused by it; the transudation of fluids through the surface of the skin; and, more especially, as it is most common in the long winter nights, exposing to the certain loss of sleep, and the very high probability of taking cold;—make dancing, with all its pleasures, chargeable with many evils. Indeed, I have frequently known that the foundation of that most fatal malady, pulmonary consumption, has been very clearly traced to the returning home from the ball-room.

I have repeatedly expressed, in the course of this Manual, that cheerful and delightful

sensations have a wonderful power in giving nervous energy to the muscles of the body: now, this is most decidedly evinced in the hilarity and enthusiastic joys of the ball-room. If it were possible to inflict upon dancers one quarter of the extraordinary efforts they use, in the nature of punishment, or as opposed to inclination, what victims to exhaustion would they instantly become! but their internal feelings beating in unison with the "light fantastic toe," they neither fear, nor do they feel, that extreme debility which such great efforts must, under other circumstances, occasion. With respect to this particular exercise, I feel I am treading upon a very delicate foundation: it has very great antiquity, and great example, to exhibit in its behalf. The great Socrates, who, if we are to credit the Pythian Oracle, was the wisest of men, not only praised dancing, but condescended himself to learn it,—attributing extraordinary effects to music, numbers, and modulated motions, in regulated time; nor was he ashamed, as we are informed, even when an old man, to consider it as a most serious thing. Other names, of great character and splendid reputation, have given their suffrage to the exercise of dancing, as both conducive to happiness and health. In the Augustan age, after the carnage arising out

of the civil wars and the proscriptions of that time, dancing was regarded as an elegant embellishment of civil life. Plato himself only complains, that some of its movements are calculated to awaken feelings which require no stimulus; and he even regulates and divides them: some he calls useful and agreeable, and rejects some as very rude, and even indecent; some movements he praises as graceful, others he admires.

The Abbé Du Bos has detailed a variety of information concerning dancing, as connected with the passions and manners; but has thrown but little light upon the subject that can be of service to an invalid, who is most interested in its bearings on his health. I remember, also, many years since, reading a work, entitled "Weaver on Dancing;" and believe he simply gives an account, that the mimics and pantomimes were introduced in the decline of the Roman empire, when a total depravity of taste prevailed. Though dancers, they had all their names from acting or imitation; thus the terms mimic and pantomime; copying all the force of the passions merely by the motions of the body, and without the help of words. Hence has arisen the Italian method of dumb show. Before I conclude upon this subject, I have to

observe, that a physician, of great eminence in his day, but now numbered with the dead, has frequently declared his conviction, that many chronic affections of some of the abdominal viscera have been removed, after the patients had been saturated in vain with medicines of various descriptions, and that he could attribute their removal to no other cause so probable as the exercise of dancing.

CHAPTER XVII.

The Influence and Power of Custom and Habit upon the Mind and Body.

The remarkable influence of custom and habit over the action of the muscles of the body, may be exemplified in numberless cases of gymnastics. The almost superhuman actions exhibited by the gladiators of the ancient Romans are almost incredible. What should we think, now-a-days, of men contending with wild beasts, lions, tigers, &c., similar to what is authenticated of the Romans? But it is not because mankind are become weakened; it is because the same motives do not exist, to induce men to develope all the energies of which they are capable. The gradual increase of the use or exertion of any of the animal functions will certainly increase the power of the function to a certain point. I do not mean to contend, that this principle can be carried on *ad infinitum;* but we can scarcely determine the extreme limits of our capabilities, until circumstances call them out. The present

bull-fights of Lisbon, if they be valuable on no other account, are still interesting, as they give modern instances of the truth of the position for which we are contending. It is not only true in those cases where mere physical power is requisite, but where very nice and critical skill is necessary to effect certain objects. The various riding schools, and the extraordinary shows of skill at Astley's, are beyond the belief of human testimony, did not our eyes behold it. The Merry-Andrew system, the tumblers, and more especially the rope-dancers, exhibit what custom and habit can effect. We all know that the parties, who astonish us with such display, do not obtain the dominion over their muscles *per saltem;* it is a very gradual acquirement, and their mechanical perfectability makes a sure but a very slow progress. Even the singers do not obtain the power of producing melody, by the almost infinite modulations of the voice, but by a slow proceeding, and often with great difficulty. The sense of sight, and also of hearing, are capable of great perfectability—not by inaction, but by perpetual use. The North American Indians trace their enemies over tracts where, to an European eye, there appears no vestige of any human foot: this is the power of custom and habit: their sense of hearing is

brought to equal perfection by the same means. The times of archery are gone by, excepting here and there an amateur of the science; but in this art the power of habit in the production of skill is wonderful. I have seen an archer, with his bow and arrow, take off the point of a crow's bill, at fifty yards distance, as it was sitting upon the bough of a tree; he could, he assured me, with equal precision, have taken off its head, or perforated its heart. So much for the power of tact in custom, and habit in our automatic motions.

The influence of custom and habit upon the structure and functions of the mind are wonderful indeed. Habit or custom produces very curious effects; it enables us to perform any work of art with greater ease than formerly; it also alters our feelings with regard to objects or exertions, by rendering that pleasing which was originally painful; and lastly, which is the most important, and is, in some respects, a most dreadful thing, it influences our opinions on some of the most dear connexions of life; it often makes that appear right, which is frequently wrong, and things appear rational and just, which, in their own nature, are both irrational and wicked. Habit, so far as it enables us to accomplish any well understood purpose with

greater facility than formerly, is an affection of the memory or train of ideas. The repetition of an exertion, or the frequent presence of a disagreeable object, is gradually productive of ease or indifference, because the pleasure or uneasiness which attends our perceptions or efforts, is always diminished by being repeatedly felt. Things, at one time very disagreeable, as fœtid smells, or the taste of tobacco, or the mental effort in the study of language, often become even positively pleasing by habit; because the pain they once occasioned gradually leaves, while the pleasure arising from activity remains and renders them, in some degree, acceptable, and sometimes, in the end, objects of passionate desire.

What is it but custom and habit, under the name of fashion, which so far influences our opinion of what is morally right, however flagitious in itself, by so diminishing the uneasiness with which we regard improper conduct, when it is continually in our view, till at last we begin to reckon it as a thing of course, and part and parcel of the order of nature? In this way it is most grievous to tell, that the most absurd laws, creeds, &c., as well political as theological, come to be regarded, first with indifference, and eventually with pleasure. This

debasing power of habit is also produced by our associating bad actions in the memory with the persons who have committed them, and with the splendid situations which they occupy in the order or rank of society. It is the character of ordinary intellects to admire and regard, with more than common pleasure, the powerful and the rich. Now this pleasure, occupying an undue share of attention, balances and overcomes that sentiment of disgust and hatred with which we should otherwise regard their improper actions. Hence, a moral wrong is inflicted solely by the influence of habit, and the vices and enormities of the rich and great are looked upon with far less hatred than the vices of men who occupy the lower stations of life; and if the force of habit had not obliterated correct moral feeling, and crushed the sense of modesty and shame, would it be possible that adultery, which frequently leads to murder, and is, perhaps, without exception, the most pernicious crime that can take place in society,—that this crime of adultery should be less punished or less hated than most offences against property?—in fact, adultery, in England, is not known to our boasted laws as a crime at all. It is not an indictable matter; it is only profitable work cut out for the gentlemen of the long robe, in the

way of action for damages. Thus the rich may make the happiness of the poor a matter of money calculation. To steal a chicken, or to filch a pocket handkerchief, is felony; and frequently long speeches are made before grand juries upon the enormous increase of such crime. But would you know the source of the difference? Gallantry, as it is called, is the vice of the rich and powerful, whereas thefts are generally outrages committed by the poor. So perverted are our moral notions also, that war between nations is contemplated without horror; and the mutual destruction of the species is regarded as a wise dispensation of Providence, to prevent the too rapid increase of mankind.

This digression concerning the influence of custom and habit has an intimate relation to the state of invalids: it proves that all our muscular or mechanical movements are decidedly increased or diminished by habit; that not only our health, but, to a certain extent, our happiness also, is governed by it; because we are compelled, by the constitution of our nature, to yield obedience to its laws. Whoever has read the Life of Elves, the Miser, by Topham, or the Life of Cook, of Pentonville, by Chamberlayne, will readily admit its truth. Elves was a miser from the habit of seeing those around

him, to whom he looked up as examples, pursuing parsimony as a principle. It was, therefore, natural to him, that it should become a law of his nature. It would be absurd to blame an individual, because all the moral influences to which he is exposed, without any redeeming properties, should produce an ascendancy over his mind. Now, Cook illustrates the truth of this principle in a very different manner: he was born poor, and continued so for some time in the onset of his life, and had witnessed deeply the sufferings that arise from poverty: he was determined to steer as clear as possible from what he considered as the greatest, if not the only, calamity on earth that he dreaded; he concentrated all the powers of his uneducated mind to one focus; all his energies were directed to this object; and as to the means, as far as a sense of shame could be presumed to act, the end sanctified them. Most men, who have seen or felt the sufferings arising from distress, naturally try to remedy the inconveniences of their situation. In thus doing, they acquire the habits of economy and industry, which do not forsake them even when they cease to be necessary. Their children are either taught, or follow from habit, the same course; unless, as sometimes is the case, extremes in nature produce equal ends; then

the children feel disgusted at the contempt for the conduct of their parents shown by society; they pursue the opposite extreme of prodigality, and thus, what is acquired by avarice is often dissipated by folly. Frugality is useful as a general rule, because the mass of mankind feel its benefits: it is far more necessary to the poor than to the rich: habits of great frugality in a very rich man, we immediately perceive, are not analogous to his station in society, and we withdraw a proportionate respect from such a character. Thus the power of custom and habit frequently gets an undue ascendancy over the understanding, and the associations of memory rule the mind. Thus the discernment of good and evil is obscured; and when the understanding loses its command, the distinctions of right and wrong, just and unjust, are very faint, and often disregarded altogether. Custom is a violent yet an insinuating teacher: she establishes her authority over us very gradually, and by a smoothness that is at first barely felt: by little and little the power increases; yet having, by such a gentle and humble beginning, firmly planted and fixed it, she immediately unmasks, and exhibits a furious and tyrannic face, against which we dare not look.

We frequently see custom breaking through

the laws of nature—*Consuetudinis magna vis est.* It has been said that our greatest vices are derived from the impression made on us in our most tender years. We frequently think that we discover genius in a lad, when we see him outwit a play-fellow by some stratagem; yet this is the ground-work of future tyranny, cruelty, and fraud. Children should be very carefully taught to abhor the vices of their own contriving; and the natural deformity of them ought to be so represented, that they may not only avoid them in their actions, but hate them in their hearts. The power of custom over the mind appears to me to be established with less resistance than over the body. Indeed, what can it not effect? It is constantly imposing upon our judgment and credulity. See its influence over all the Mahometan States: they are as firmly persuaded of the truth of the law of the Prophet, as we are convinced of the truth of the revelation of Jesus. Thus they substitute prejudice and custom instead of divine truth.

It has been said, that there is no fancy, how absurd soever, that can enter into the imagination of man, that has not the example of some public practice, and that will not prove a sanction to our reason. Even miracles appear such to

us, because we are ignorant of the laws of nature, and not from the nature of the thing. Custom blinds the eye of judgment; for if a reason be required of us why we do a thing, we have a ready answer—we say, "Does not every one do the same?" In this manner, habit and example hide the true aspect of things from our eyes: thus a scrutiny into the abstract reason of things becomes very difficult. A great variety of things bid defiance to research, as to a foundation in nature and truth; justice, for instance, is simple, and ought not to be hedged in with local distribution or jurisdiction; yet what a complexity is exhibited in this divine article, not only in the various nations of the earth, but in the different courts of the same kingdom. Can any thing be more abominable,—and it is known as a matter of history, in a neighbouring nation, —that the venerable office of a judge has been sold, and sentences have been purchased with money? In a philosophical view, the laws of all countries ought to be the perfection of reason. We need not ask what they are in their practical operation; and if the force of habit had not destroyed in us the very blush of shame, could we possibly endure such a reproach But things grow familiar to our minds by their being very often either seen or felt: the mon-

strous become passable by custom: even our curiosity becomes less. Habit makes absurdities familiar; we neither admire beauties nor censure defects, nor do we inquire into the causes of them. It is clearly the novelty, rather than the grandeur, of things, that induces us to investigate their causes. Custom and habit exert their power over our opinions; for even poverty and riches are much altered in their nature by the opinion which we entertain of them; for riches, no more than either glory or health, have any more value than we please to attach to them. Every one is well or ill at ease, just as he feels himself; not he whom the world believes, but he who believes himself; and in this particular, belief gives itself being and reality. All external accessions or deprivations, therefore, receive their relish, colour, and character, from our internal constitutions; for, in the absence of bodily pain, it should seem that custom has a tendency to deaden every sense, both of the good and of the ill, and levels all things.

CHAPTER XVIII.

The Sea Coast; its frequent injury to Invalids, especially in the Summer Months.—The most desirable Retreat for an Invalid.

The advantage to individuals in dyspeptic complaints, of breathing in good air, has been particularly considered, under the chapter which treats of the function of respiration; but there are other benefits, which have not yet been detailed, viz. the operation of good air and water upon the skin. We represented, when speaking of exercise, the great advantage the surface of the body received from friction, and recommended the use of the flesh-brush, particularly to the extremities. The ancients, in most of their writings, very much applaud friction, as an agent of much power, both in the prevention and cure of disease. The moderns have disregarded it, without wisdom or excuse: of late a party have started up, who again are restoring the practice, and, in some cases which

I have seen, with very signal advantage. The veterinary surgeons are devoted to the use of the curry-comb; and they assert, that, from the stimulus thus applied to the skin of the horse, his animal spirits, and capability for exertion, are greatly increased; they say it makes him look sleek—he becomes gay, lively, and very active; and they suppose that the function of digestion is much improved by the practice. The force of analogy will apply this mode of reasoning to the advantage of invalids, in all cases where torpor of the minute vessels of the skin is one of the symptoms of the complaint.

Upon a visit to the sea-coast, our invalid very naturally wishes to be informed upon the subject of bathing, and under what circumstances, and what degree of temperature, it would be most advisable for him to engage in this operation. In the first place, he should be informed that it is by no means an inefficient process. The skin, —an extended surface, highly vascular, and reticulated with a nervous expansion,—has very important functions assigned to it, and those functions have an intimate relation to the stomach, and the whole of the assimilating organs. It may fairly be inferred, that there is no neutral ground upon the subject of bathing; and that, in almost all cases, in which there is

no benefit received, there is positive mischief suffered. Great danger will often arise at the very onset of the process, on account of patients indulging their taste upon the matter without advice,—and indulging in it rather as a matter of luxury, than as a process for the recovery of health. They are liable, also, to mistake their sensations, and imagine themselves labouring under debility, when it has sometimes happened that internal inflammation in some of the thoracic or abdominal viscera has been subsisting; and the use of the cold bath under such circumstances has been fatal to the patient. That peculiar debility caused by great anxiety or mental exertion, in the absence of bodily disease, often vanishes after cold bathing, and the strength of the patient is restored. It is perhaps a matter of importance, as to what particular time of the day cold bathing should be employed. The dyspeptic invalid should never venture into a cold medium without the stomach receiving the stimulus of food. The robust and the healthy may bathe early in the morning—if, indeed, they should feel any necessity for bathing at all; but, as a general rule, the period best chosen for the cold bath, should be about two hours after having taken breakfast. Dr. Currie notices that patients ought not to wait on the

edge of a bath, or of the sea, until they be perfectly cool, for if they plunge into the water in that state, a sudden and an alarming chilliness may be expected, which would not have been the case, had they been moderately warm when they went into the water. In the opinion of the writer, an invalid should never remain longer than about one minute in a cold medium, and he should be covered all over with the water; the air should not come into contact with some part of the body, while the other part is immersed; a bath at a temperature of about eighty-five degrees Fahrenheit is perhaps the best to begin with; it can easily be lowered to a number which will suit the patient. The cold bath should never be employed, if the patient complain of any fixed pain in the head, side, or any part of the chest, where congestion of blood in any of the vessels may be presumed to exist; or in any case of internal inflammation; under such circumstances it is capable of producing very serious mischief.

The use of the *warm* bath need not be encumbered with so many memoranda; it is very often useful in local affections of the joints; it must also be useful in many cases which require the circulation to be carried to the extremities of the vessels of the skin. Count

Rumford has published such a very interesting Essay upon this subject, and many of his positions are so very true and proper, that the reader may safely be referred to him as a guide upon this matter. Perhaps a patient ought not to remain longer in the warm bath than about twenty minutes; and as to the time of the day, the best for employing it is about an hour or two before dinner. The author before mentioned says, that a person may gain fresh health, activity, and spirits, by bathing every day, at two o'clock in the afternoon, at a temperature of 96 or 97, and remaining in the bath half an hour. Warm bathing has been presumed to have a very debilitating effect, as being the converse of cold bathing, which is known to be restorative; but this does not of necessity follow, nor does the cold bath inevitably give power: the effects of both are governed by existing circumstances, which will form the rule for the patient. If warm bathing should induce profuse perspiration, it should be abandoned, as this circumstance will generally be hurtful to an invalid. As warm bathing is known to lessen the resistance in the arterial system to the action of the heart, it would, perhaps, be best to avoid it in the evening; the accelerated action of the vessels, near the surface, might provoke a nervous

irritability, inducing restlessness and absence of sleep. With temperate baths, and the shower bath, the invalid ought to be but little acquainted, as the principle upon which they can be useful he cannot be presumed to know; and if he be under the guidance of a scientific practitioner, all observation upon their use would be unnecessary.

Before any observations are made upon the advantage of the air of the sea-coast to invalids, I shall notice that, in the case of dyspeptic patients, it would appear highly probable, from the symptoms, that it is chiefly from the sympathy which is felt from mental inquietude that the disease is caused. A very full illustration has been given of the functions of the stomach in this Manual, and in which it was demonstrated to be the grand organ of constitutional sympathy. It is very difficult to explain a variety of very distressing local affections of patients in particular parts and organs, where no symptom of diseased function, or of organic lesion, may be presumed to exist. These affections are said to arise from sympathy; yet no connexion, perhaps, can be traced between the source of the stimulus and the seat of local pain. Vascular fulness is generally an accompaniment of that series of anomalous symptoms which

usually belong to dyspepsia; and the author has very long been convinced, that not only flatulency, indigestion, palpitation of the heart, hysterics, and likewise that peculiar feeling called heartburn, are entirely affections of the beautifully nervous web-work expanded on mucous surfaces; often in the cavity of that particular organ, to which the sensation happens more intimately to refer, as are many other sensations at present very unaccountable; but it may be asked, how does it occur, that the nervous expansion on mucous surfaces is so peculiarly affected by mental emotions? I answer, because the surfaces are *secreting* surfaces. It has before been explained, and it is hoped to the satisfaction of the readers of this Manual, that the functions of the brain have a direct and immediate power over all the secretions, whether of glandular or of membranous structure; and in which it was asserted, that it was a proof of great ignorance of the animal economy, to deny the vast power the mind possessed over the whole capillary system. Upon this datum arguments may very safely be grounded, to explain not only many of the symptoms of dyspepsia, but the manner of obtaining relief from many of the remedies which are often employed.

The author has sometimes seen violent dyspepsia produced by a very evident cause—*deep sorrow;* and which was accompanied with a morbid vascular fulness of the villous coat of the stomach;—lower orifice became painful, and a schirrous tumour formed, which ended in cancerous ulceration and death. It is a very usual thing, when what they commonly call a disordered stomach takes place, to attribute such uneasiness either to the quantity or the quality of the food that has been taken; but it is, perhaps, well known, that if the internal feelings be perfectly in unison with the external circumstances, neither the quantity nor the quality of the food will produce the smallest effect;—nor, perhaps, will it produce any inconvenience in healthy stomachs. It is usual with some people to attribute the effect to the formation of acetous acid; with others, to the extrication of an unusual quantity of carbonic acid gas; but the curiosity of the fact is, that neither one nor the other of these substances will produce a similar uneasiness in the stomach of any healthy person: to any thing, or to almost every thing, may it be attributed, save and except the true cause, viz. the omnipotent influence which the mind has over the reticulated nervous expansion upon mucous mem-

branes, which line the internal cavities of most organic structures.

These preliminary remarks, which would appear, to a cursory observer, not to be intimately related to the subject of this chapter, were introduced with a view to illustrate some observations, respecting the benefit to be derived from leaving the metropolis, and going to the sea-coast, which is become a very fashionable practice of late years; and, in regard to the benefit derived, many are of course highly gratified, while others are equally disappointed.

The effect of the different gases, or aëriform fluids, upon the constitution, when introduced into the blood by means of absorption from the air-cells of the lungs, has been sufficiently explained in a former chapter. The effect of cold and warm bathing, and also of friction of the surface of the skin, has also received recommendation; and its beneficial operation upon health has been shown; but the operation of the atmosphere upon the healthy functions of the animal economy has not been sufficiently illustrated or explained. The skin and the lungs present most extended surfaces for the absorption of this vivifying fluid: nor has sufficient credit been given for the very great advantages which have been received from this

source. It may be said,—What benefit can arise from the change of air? is not the air nearly the same in all situations? does not air, analyzed by chemistry, present nearly the same combinations and results?—That change of air has a powerful influence upon invalids is an indisputable truth; —how it produces that object, is a circumstance worthy of inquiry.

The experiments of Gay Lussac, in his aërial ascent, in the month of September, 1805, would lead us to suppose there is no distinguishable difference from the greatest elevation: he went nearly 8000 yards above the level of the sea, and found very little difference in the composition. It cannot be denied, but there are various foreign bodies in the air, either in chemical solution or mechanical union: where there is a dense population, there must be a great quantity of carbonic acid gas, animal exhalations of various kinds, and smoke in abundance. The question immediately recurs—What are the co-existing circumstances that render the air of some places so much more healthy than others? and from what source arise the advantages which are experienced by invalids from change of place? This question may be answered by another:—Is it a fact, that they do receive this advantage? and can such benefit be fairly laid to the account

of change of air and of place? In another chapter of this work, it was asserted that the large capitals of Europe were, more or less, the sepulchre of the dead and the hospital of the living: the mortality of the people in the metropolises of several kingdoms were stated, and a comparison made with the surrounding country villages; and the result of the comparison proved the truth of the proposition.

We have every day proof that children become very unhealthy when constantly confined to the air of large cities; robust and healthy persons are not so much affected. We have a proverbial saying—"The weakest must go to the wall." In all unhealthy situations, the highly irritable susceptible being is nearly certain of becoming a sacrifice; on this account the delicate dyspeptic invalid should avoid, if he have the power, the insalubrious atmosphere of large cities. To the philosopher, an examination how these effects are produced, may be interesting; but to the invalid, nothing is so valuable as to know how to avoid being the victim to whatever cause the unwholesome properties of the atmosphere of large cities may be attributed—whether to dampness and stagnation of air, or to the animal effluvia and the carbonaceous matter which is constantly floating about

them and in them. That they are so is certain; and to the truth of this the bills of mortality will bear sufficient testimony. It is, perhaps, not sufficiently known, that the skin is an absorbing surface of great extent, as well as the air-cells of the lungs; and the action of the absorbents are continually, with their bibulous mouths, taking up particles which produce important effects upon the animal functions: we know that iron will rust with more rapidity in London than in the country; we know, also, that plants will wither and die, after they are brought from their nursery grounds and placed in the London court-yards, although they may have been attended to with much care. I am persuaded that cheerfulness and the animal spirits are produced and increased, as much by the process of absorption from the skin, as from any other cause; and when the mind is happy, it tends, more than anything, to regulate the feelings which have such great influence over all the secretions and excretions of the body.

The sea-coast has been found often hurtful to invalids. In most affections of the lungs, and in cases of spitting of blood, it has accelerated the fatal event. In the summer months, the intense heat of the sun frequently produces

lassitude and debility; and it often happens that you have no protection from the power of its rays, either by shelter or by shade. The comforts and benefits arising from the breezes of the sea, are to be experienced by an invalid as useful only in cases of simple debility, in which its effects are restorative. It will be of no use to go to the sea-coast with an organic disease, as it confers no sort of advantage. I have said that Penzance is a desirable situation for many people in ill health—and it certainly is so; and many parts of Devonshire, not very far from the coast, would be, perhaps, a very healthful and desirable residence for an invalid: but change of place is as beneficial as change of air; monotony of scenery is irksome to people in health, and must be more so to those under various causes of irritation. But, although I think the sea-coast not to be chosen for the abode of the patient, a rural residence offers every probability of advantage. The enjoyment of pure, sound air; simple and frugal food; away from the corroding sensations of avarice; daily exercise without doors, in proportion to the muscular powers of the person; established regularity in all the vital functions, and a frame of internal peace and serenity;—what sources of vital restoration are here exhibited! Were

it possible to be surrounded with intellectual society in the country, equal to what can readily be found in London, who, possessing the liberty of choice, could hesitate what to do? Who would not remove from the dissipation and worthlessness of large towns, where fashion,—the bane of wisdom and the law of folly,—rules triumphant, and where many deadly vices lose their natural deformity by the frequency of their practice? A country life affords the best chance of equanimity and peace of mind, which are the great supports of life; our enjoyments are increased without violence or passion, and moderated by the eloquence of nature,—quiet and serene, inspired with cheerfulness and hope. Can we wonder that, uniformly, the greatest instances of long life are to be found in the country? In rural retirement, with good health, moderate fortune, and a happy partner in marriage, he must be insensible indeed, who would not lay his hand upon his heart, return thanks to his God for the happiness, and exclaim—

"How bless'd do I live! how calm will I die!"

CHAPTER XIX.

The Attachment of Sex, a very important Feature in the Character of Health.—Improper Attachments to be early checked, before the imagination becomes absorbed with its Object to the Injury of all the Animal and Vital Functions.

THE subject of this Manual is the attainment and preservation of health, and the very interesting matter of this chapter will receive no other discussion than as it relates to that object, either physically or morally. In the examination of causes connected with various matters of inquiry, it has often occurred to me, that we often overlook those which lie nearest to us, and assume others, frequently the most absurd, in order that our minds may be at rest, and that we may indulge the indolence of our dispositions as much as possible. The first fact which I shall notice upon this subject, is to assume, that it becomes the duty of every person who has the guidance and guardianship of youth, to take care that sexual attachment should receive no artificial

excitement to call it too early into existence. The preservation of the species will not be endangered by the exertion of individual prudence, but the happiness and health of the party may be immolated by the absence of discretion; nor can I reprobate, in language sufficiently strong, the depraved taste and demoralized principle which induces young men to seek gratification and enjoyment from a variety of females: it is an outrage upon the most important of nature's laws, the violation of which is sure to produce mischief and repentance.

Those who have read Tacitus *De Moribus Germanorum*, must admire the description which he gives of the manners of that people in regard to chastity and marriage. In relation to their health, sexual intercourse was regarded by public opinion as a crime, previous to the connubial state. None of the imaginary evils arising from continence, which a licentious mind creates to itself as an excuse for indulgence, were either felt or feared by the Germans. The muscular powers of the body, and the energies of the mind, received their full developement before marriage was thought of or expected; both mind and body united to give energy to character, and produced a result which caused the astonishment and the terror of the Romans.

Among such a people, nervous invalids must have been an extraordinary phenomenon. It is to be supposed there was but little mental irritability, few cases of insanity, little of hypochondriasis among the men, or of hysteria among the women. I should apprehend there must have been but a very moderate demand for any hypercritical researches in pathology or medicine; and probably, as they were but little required, they were but little studied. It does appear to me, that the present age has very much fallen into a taste for the times of chivalry, and that all romances must, either more or less, assume that form, in order to please. I have always admired, and still think worthy of admiration, the great, noble, and resolute principle of thinking and of acting of those old Germans, who, from the forests of their nation, gave brilliant examples of moral feeling, and of institutions, which have been adopted and imitated by modern nations, in the exact ratio of their love of freedom. The more we are excited by their example, the nearer do we approach the proper dignity of the human character; and in nothing were they more remarkable, than in their strict continence, and in sparing their physical manhood until the proper period arrived for marriage. Voluptuousness and debauchery,

the prevalent vices of modern times, formed no part of their character; the physical propensity to amorous intercourse with the female did not, among them, sink into brutal enjoyment, but was exalted into sentiments of honour and fidelity. The historian says that each person bore in his heart the image of his beloved object; and this romantic love was the shield of his continence and virtue, and this abstinence gave physical energy to his body, and courage and resolution to his mind. These notions may be considered as romantic, or even impracticable, by the irritable and fastidious being of modern times; but if health, strength, and longevity, be objects of acquirement, they must still, to a certain extent, be adopted. The passion of love, which, in those times, was, among that people, regarded as a security against luxury and voluptuousness, is at present degenerated into mere brutal gratification. The virtue of chastity till the period of marriage, which is the principal foundation of moral firmness and manliness of character, has become a subject of irony and ridicule; and, as a learned writer has properly said, that, which ought to be the last and sweetest reward of toil, labour, and danger, has become a flower which every stripling crops by the way. If any purpose of nature be clear

with respect to the union of the sexes, it is that of an indissoluble union of hearts in affection and love; and this alone can lay the foundation for a dutiful generation of children, and a healthful or happy old age.

There is nothing that requires more discretion than sexual indulgence, as it respects both the health of the body, peace of mind, and salvation hereafter. It has been found by experience, that those persons who have employed their minds upon serious and abstract subjects, have had this feeling more under restraint than others not so employed; as, by these means, they are induced to avoid all artificial allurements, and the simple impulse of nature is allowed to run its course without excitement. It is impossible for a well-regulated mind to view early, irregular, and illicit indulgence, without feelings of horror. Is a man the seducer of early innocence, or of conjugal affection, his moral degradation is complete; for he who has exposed to physical and moral misery an innocent being, whose future errors and licentious conduct must be ascribed to him as the first exciting cause, is "ripe for treasons." There was little of infidelity to the marriage bed among the Anglo-Saxons, our German ancestors; the thirst for gold did not cause among that people improper

or incongruous matches, incompatible with human peace. Universal execration would have followed the monster who should disturb and poison the matrimonial and domestic felicity of a whole family, for his brutal and sensual gratification. What are the physical results to the unhappy female, who becomes the victim? Sorrow and perpetual grief, acting upon a too susceptible temperament, disturb the function of the brain, and change the healthy actions of all the glandular and nervous structures; every perception, every feeling, is associated with horror, until its progression often terminates in insanity and suicide!

These effects upon the health and existence of the poor sacrificed victim are manifested by every day's experience; but the crime of corrupting the wife of, perhaps, your friend, has consequences more extended, if not more dreadful. This is a crime which, according to every moral tendency, is more detestable than robbery, or even murder, which it often causes; for what is the value of any other property, when held in comparison with the property of the heart? and what is the robbery of goods and chattels, when compared with the destruction of all natural sympathies? A rapid succession of crime generally follows these enormities; nor can it be

expected that the sensual character will abstain from the lesser, when he has so frequently practised the greater, evil.

There is a disease of a terrible character, which should seem to be designed by Providence as a punishment justly appropriated to the criminal who indulges in licentious gratification; but spectacles of misery, in the sufferings of others, are seldom of sufficient efficacy to reclaim the party, whose passions hurry him to his fate; not to mention, that pathological science has so much advanced within these few years, that the power medical knowledge has obtained over the dreadful symptoms caused by this disease, greatly diminishes its horrors, and of course, with it, the force of example.

But it may, perhaps, be properly asked, why do I compare the simplicity of the iron age of the ancients with the golden age of the moderns? The difference of circumstances will always produce corresponding results. Luxury and refinement engender a taste for fastidious and expensive enjoyments, which cannot be compassed by persons of moderate income: example, custom, and fashion, with inexorable tyranny, are continually goading on persons to a mode of expenditure which their income will seldom bear; and as the state of marriage,

in modern society, is such as to give occasion to very great increase of expense, many are obliged to avoid it, because they will not sacrifice the appearance of wealth to the reality of the pure enjoyments of nature. The battered beau, the debilitated debauchee, after having rioted in the round of sensuality, verging near his half century, begins to look about him for a wife; but where seeks he the wife of his fancy? A respectable female, but little below his own age, will never suit a man of such habits; he must look about him for youth, beauty, and fortune: and if he have little or no property of his own, the more necessary is it that he should cunningly fasten upon his object; swear, and forswear, that she alone can make him happy; and, if she have the misfortune to believe him, he boasts that he has made Cupid the broker to supply his own necessities; and, when too late, his young wife detects the unworthiness of his motive, respect is banished for ever: thus, for the most part, they live on, to love less and less. And now permit me to ask, if those who are so closely united, and in whom so many sympathies ought to play in unison are the torments of each other, where shall we find tenderness, comfort, or consolation?

But will you ask me what bearing or relation

this has upon the subject matter of health, which is the object of this Manual? I answer, that nothing influences happiness, or misery, so much as sexual intercourse, either with or without marriage. Persons who are happy are generally in good health; and those who are miserable are either diseased, or soon will become so. Well-regulated affections are certain evidences of passions held in control, and of a judgment unclouded. Perhaps nothing can be said to be well done, that is done out of season. It is said "that May and December can never agree." Marriages may be contracted too early, or too late: both are evils; but they are evils of very different kinds: very early marriages, before the powers of nature are fully developed, are injurious to health, both of parents and offspring; besides, they are apt to cause a rivalry between parents and children; the son or the daughter is anxious to come into the enjoyment of the world, before either the father or the mother shall be willing to quit it. A celebrated writer has said, that the daughter begins to bloom before the mother can be content to fade: thus jealousies are created; irritations are formed; and causes of vexation and disquietude arise, rather out of the nature of circumstances, than from want of affection, or personal dislike; and

in a society of artificial wants and fastidious desires, a very numerous progeny requires a large expenditure, which cannot always be conveniently met. Thus mutual recriminations too often exist, when the *res angusta domi* appears as an occasional visitor, or a perpetual inmate, asserting the truth of the often-repeated observation, "that when poverty comes in at the door, love flies out at the window."

Can we promise better results from marriage contracted too late? Can it, with propriety, be said, that the longer the time which is employed in deliberation, the more fortunate or happy will be the choice? Will length of time employed in balancing of chances inevitably give advantages in this matter? Where marriage is a circumstance of cold calculation, and the passion of love and affection is out of the question, time will increase experience, and give better opportunities of research and selection: the number of children will, also, probably, be fewer, and they will not so immediately tread upon the heels of their parents. But it must be recollected, that as life advances, opinions become fixed, friendships are contracted, and habits are established. Nor will it often happen, that either will be readily induced to forsake that which custom has rendered pleasing. Time

itself, as it insensibly modifies the external character and manners, also determines both the power and the direction of the passions; and whoever attempts materially to change the bent and course of his own life, will very often find such labour to be vain. And can we expect to do that with others, which experience demonstrates we are unable to do with ourselves?

The author remembers the observation of a much esteemed, but now deceased friend, who often declared, that there was nothing that so properly excited the sympathies of others, as a father reduced to poverty by a numerous family. If the accurate calculator determine to marry late, because his children shall be few, he will find, by experience, that if, from this source, he have less to fear, he will have also less to hope; and although I cannot counsel or advise marriage too early, the greater evil is certainly marriage out of season, or too late. The sweet endearments of early love they lose, without any equal value; and what can compensate for the great probability of leaving helpless children, deprived of a parent's care or affection, ignorant, and perhaps diseased, without either a heart to pity, or a hand to relieve? And what grief must assail a parent, who knows he must leave the world, before those whose existence he has caused

can have acquired either knowledge or discretion to conduct themselves in it? Nor will leaving of property always secure the object for which it is intended. When the shepherd becomes a robber, the lambs will be fleeced. Nor is this a mere theoretical suggestion; the records of the Court of Equity exhibit but too many practical evidences of its truth.

But, according to every principle of philosophy, we must acknowledge, that to every effect there must be an adequate cause: all the phenomena, both physical and moral, that exist in the world,—what concerns us here, as living beings, or hereafter, as subjects of a retributive providence,—have their spring either in the physical nature of man, or in the institutions of society to which he is compelled to yield obedience. Therefore, what must be the cause why the licentious should avoid both the comforts and advantages of marriage, and pursue a career of folly and of guilt? It is the mammon of unrighteousness—that sacred thirst of gold—that root of all evil, which seems to have taken an undisputed possession of the human heart. All the laws of civilized life view the protection of property as the end of their institution, and which they effect by the execution of numberless living beings, who are continually sacrificed to

this Moloch! Even the ministers of our holy religion are but too much tainted with this disease of the mind; they, whose kingdom should be hereafter, and who declare that covetousness is idolatry, and that "it is easier for a camel to go through the eye of a needle, than for a rich man to enter the kingdom of heaven,"—these sacred characters, instead of stemming the current, are content to float with it. Virtue is praised, but starved; avarice is condemned, but practised; the profession of godliness is made great gain; and whoever does not amply provide for the wants of his own household, *per fas et nefas*, is considered as having denied the faith, and is worse than an infidel. Therefore, in the only legitimate intercourse of the sex,—the institution of marriage,—avarice forms an important feature, both as to the time and the object. Marriages, which ought to be so largely an affair of the heart, are entered upon from principles of convenience or expediency: under some circumstances, it is little better than legal prostitution; for if the goods and chattels of the betrothed parties can be brought to unite, their loving and sympathetic souls will ever be found ready to guarantee the treaty!

The learned Burton says, that the dearest affections of the heart are made a matter of

bargain and sale; that marriage, whose superstructure should be built upon the foundation of health, love, and care of offspring, is reared upon that of private convenience; and often, from more degrading motives, we marry disease, and, as a valuable consideration, we receive money. This, he says, is the great goddess we adore and worship; this is the sole object of our desire. If we gain money, we are esteemed, notwithstanding our habits; if we are unfortunate, we are despised, nor shall we be thought to possess either talent or virtue. The respect of the world lasts no longer than our wealth; when that is gone, farewell friendship. The dearest ties of nature are broken by poverty: and when money is gone and spent, the lamp of love is out; for money was the fuel that fed the flame. We love those that are fortunate and rich; we admire those who thrive; we hate and abhor those, on the other side, who are poor, ill, and miserable, or by whom we even suspect it likely we shall suffer loss or inconvenience;—there is nothing so agreeable as profit. Health is considered a precious thing; to recover and to preserve which, many will undergo almost any misery; but some are very reluctant to give money for it. But give them wealth and honour—give them gold—you immediately

possess their affections. Thus it was when Lucian wrote; and Burton says, that the moderns are worse, because they endeavour to conceal their guilt under the mantle of religious hypocrisy.

The observations heretofore made upon this subject, have related to its physical and moral influence upon the health; but the attachment of sex has other very important pathological relations. To the critical observer it is well known, that the union of sex is caused by feelings more early and more powerfully excited in some temperaments than in others. It should be a matter of very early inquiry, whether there exist any sufficient cause, or obstacle, which ought to be held as a sufficient reason to prevent the object in view: affection ought not to be called into action, where there are insuperable barriers to ultimate union. Females, particularly, are liable to severe mental affections from disappointments of this nature; because, from their high nervous susceptibility, their feelings are much more acute; and because of the vital importance to them of being happily matched,—their peace of mind, and health of body, depending upon that event,—it is truly the crisis of their fate. The predisposition to

disease has been discussed in the other part of this Manual; but the hereditary character of disease presents new features and dreadful consequences to those who consult only their own convenience of wealth and expediency, without taking other valuable adjuncts into the account. Who, that has any love for their children, would be the voluntary cause of propagating hereditary diseases? Would any man be happy under the thought, that suffering disease and premature death, had been inflicted by him, in the want of discretion in properly selecting the object of his choice? Neither male, nor female, should be induced to form a matrimonial union, where mania, gout, and more especially scrofula, are known to exist; and although the fashion of the times has been pleased to discredit much of the humoral pathology of the ancients, sufficient remains to demonstrate that those diseases, and others that might easily be named, are undoubtedly transmitted by parents to their children. It is much to be regretted that, if the adored object have captivated the affections, less attention is paid to this subject than its importance demands. These diseases induce painful sensations; these sensations disturb the accuracy of the perceptions; the temper is soured,

and motives are misrepresented; and as it has pleased Providence to make an organized material substance the medium by which all the mental energies are carried on, every day's experience affords abundant proof that the mental affections are produced by the bodily feelings and movements which accompany them, and by the trains of thought, or of action, to which they give birth: but this subject has never been carried on to its remote effects.

There is a disease which produces a gluey softness of the bones; in this the animal gluten abounds, and the earthy particles of the bone are absorbed. Now, this disease has been remarked to occur in children—the produce of very early, and in those of very late, marriages: deformity of figure is the result of this disease. When invalid unites with invalid; when morbid irritability seeks a union with nervous susceptibility, what product can be expected? The breeders of animals have a method of improving the race, by what they call crossing the breed: nature seems to exert the power of almost infinite variety; uniformity and sameness appear to cause degeneracy and weakness. Our object should be to acquire power both of body and mind, and to transmit these blessings to our

children. The most certain method of obtaining such desirable objects, is to adopt the means that have been recommended to diminish our susceptibility to all morbid excitements; we shall then both attain and preserve our health.

CHAPTER XX.

Various Affections of the Skin, so common to Invalids.—The Peculiarity of the Herpetic Tetter in the Face.—Its Dependance upon the healthy or disordered State of the Secretory Organs demonstrated.—Means of Prevention explained, and Remedies proposed.

We can, perhaps, scarcely receive a better proof of the sympathy of parts, as suffering in conformity with the particular state of the mind, than is exhibited in affections of the skin. The various authors who have written upon cutaneous disorders, have ascribed it to various causes; and many of them very different in their nature to each other. It has often been asserted with great confidence, by many who were said to be "*wise in their generation*," that all affections of the skin are caused by the stomach being in a suffering state; and a particular state of the skin is now commonly called a surfeit. The intestines, and the whole of the abdominal viscera, have in their turn received the character

of producing a correspondent derangement of this organization. Perhaps it would tend to illustrate this matter somewhat, by describing the particular texture which is called the skin. If we view its surface, even with the naked eye, we shall find it to be very porous,—more so in some places than in others; and the pores are also much larger in some parts than in others. By placing a portion of this tissue under a lens, we discover that many of these pores are ducts of sebaceous glands; others serve to transmit hairs; another class are, perhaps, of a secretory character,—for the perspirable matter is seen to exude through them. A class of vessels, with bibulous mouths, are also found by the sides of these pores, which, from their function, are called absorbents; and these vessels take up morbid fluids, under certain states—as in the bite of the mad dog, the case of inoculation for cow-pock or small-pock, and several other affections or states of the body: in dropsy, for instance, the skin absorbs fluids from the atmosphere.

Without, however, attempting to elucidate what are often called final causes, but simply to record facts as they are exhibited to our senses, it will be sufficient to observe, that the complexity both of the structure and function of

this texture is very evident. It has a variety of properties; it is endowed with great powers of dilatation, and a corresponding property of elasticity: we are unable, however, to detect muscular fibres; but it has properties very similar to muscle, for it contracts and relaxes. Another peculiar property is its extreme vascularity. The property of intense sensibility is equally evident: the net-work of nerves, which are spread over its whole surface, is the cause of intense suffering under circumstances of inflammation or disease. Those who have undergone surgical operations, uniformly agree that the anguish was greatest in the division of the skin. It is thickest in those parts of the body intended by nature to bear weight or pressure; as on the back, the soles of the feet, and palms of the hands. We find it thin on the fore-part of the body, on the inside of the arms and legs, and where opposite surfaces touch each other. It is extremely thin on the lips, and in very delicate complexions it is transparent, and the colour of the blood may be seen shining through it. All parts of the body are not equally endowed with sensibility: the marks of superior feeling or touch in the skin, are the projections above the common surface of those little congeries of nerves, arteries, veins, and absorbents, called

villi. The nerves upon the skin may be said to be an expansion of net-work, rather than distinct chords: they are here very small, but very long and numerous. Perhaps there is no part of the living texture subject to such a variety of distinct and specific eruptions as this structure. This must arise from its whole surface being an assemblage of secretory organs. The nervous energy acts upon the skin at every instant, and a critical eye can easily discover even the minutest effect. By the impulse of hope, the face glows with animation: it is a stimulus which increases the momentum of the blood, and gives spirit and power to every mental feeling. On the other hand, the sedative operation of fear renders less powerful, but more tremulous, the action of the heart and arteries. It, to a certain extent, may be said to paralyse the whole mental machinery: its decisive effect upon all the secretory surfaces is instantly evident; the face is as pallid as death; the extremities are cold; the heart rather palpitates than contracts; the whole surface of the skin is in a state of spasm; and the human body, under its action, positively occupies less space than it did when free from it. The little congeries of vessels, lately described as small protuberances, by which certain functions were performed, increase greatly in size,

appear like little mountains upon the surface, and obtain the name of goose's flesh. The larger glandular structures do not escape its power. the kidneys instantly secrete most abundantly; the bladder can no longer retain its contents, and an involuntary flow takes place; the whole cylindrical surface of the intestines participate in the effects, and an abundant excretion succeeds.

This simple principle will not only elucidate the nature of a variety of the eruptions and diseases to which the skin, in cases of ill health, is more particularly liable, but has a direct reference to that universal sympathy of parts to which all nervous tissues are subject. The author has before fully discussed the physiology of the stomach, and demonstrated that it is a great organ of sympathy; but he should think himself much mistaken, were he to attribute almost every evil to which the human frame is liable, to the stomach. An eccentric physiologist of modern times has carried his opinions to such an extent, as to cause apprehensions concerning the sanity of his understanding. He is right, to a certain degree, as to what is often called the proximate cause; but there is also a predisposition to disease, which is often invisible to the eye, and sometimes inscrutable to the

understanding. The agency of the stomach is only an effect of a previously existing cause. It may, indeed, originally be subject to organic disease, like any other viscus; but as the productive cause of affections of the skin, or other structures, it acts only by sympathy. It is very true that none of us,—even the best philosophers,—are infallible: we but too often mistake effects for causes: the author could as easily believe that the disease of the maniac, whom a misapplication of words often terms a lunatic, was caused by the influence of that planet, as he could be induced to believe that the stomach is the cause of the variety of affections for which it has the credit. If an eruption upon the skin happen to take place after certain food is taken, it is immediately described as indigestible, and that nature has relieved herself by the throw-out upon the surface. Dr. Robert Willan had been for years in social intercourse with the author; and his opinion of cutaneous affections, as to their cause having uniformly been referred to the stomach, suffered some change before his voyage to Madeira, which ended in his lamented death. The brain is the source of all the nervous power. We know, from experience, that the skin immediately feels the effect of all the mental emotions

—joy, hope, shame, terror. It participates in every feeling; is respondent to every sensation: it is, to all intents and purposes, a secretory surface, and, of course, liable to all the changes, either in function or structure, to which the varied and rapid alterations in the state and temperature of the atmosphere renders it subject. On all susceptible textures, the peculiarity of the stimulus gives the character to the morbid results; and this position is explained by the nature of the stimuli of various affections which most concern the skin, — as scarlatina, small-pox, measles, erysipelas. The various description of herpes, pemphigus, several of the blooms or efflorescences, and what are often called mental roses, which give a glow upon the surface, are all so many proofs of the local irritability of the capillary vessels. One of the diseases just mentioned, viz. pemphigus, is clearly a constitutional affection, and the functions of the brain are disturbed before the eruption appears. It is very reasonable to imagine that this disease must long have existed, but only in modern times has it been described with any tolerable accuracy. So very rare was the disease when Dr. Cullen wrote, that he never saw it until it was shown to him by Dr. Home. The symptoms are, intense pain in the

head, sickness at the stomach, great oppression about the heart, excessive lassitude and weariness on the least exertion, with great stiffness and rigidity of every joint: there is also some affection of the mucous membranes; for the throat is very sore, skin intensely hot, the eyes very dull and languid, but seldom with delirium; the whole surface of the skin is interspersed with bladders of various sizes—some of them of the size of an ordinary walnut, and, in some instances, larger, especially on the arms and breast. After existing for a certain time, they form a whitish scab, or crust; and the constitutional symptoms declining in the same ratio, the patient recovers his health.

We have observed, that the herpetic tetter is very common to invalids; and, from some cause hitherto inexplicable, it fixes its seat very often in the face. This fact alone, unconnected with other considerations, is sufficient to render it an object of interesting inquiry. We have already explained the pathology of some of the diseases of the skin, as arising from certain states and conditions of the mind, and have considered the stomach simply as an agent in producing eruptions on the surface. The term herpes has been given to this particular tetter, from its disposition to spread, or creep, on the skin. It covers a

large space in a small portion of time. They may be classed into divisions, each somewhat differing from the others: they are known by an assemblage of numerous little creeping ulcers, forming clusters, and itching very much; often difficult to heal, and terminating in a sort of branny scales. This particular eruption has obtained the name of the dry tetter: it is the most simple of all the varieties, and there is less of inflammation and heat before it terminates in its scurf. There is much of itching during the period of vascular inflammation. Their course is ended by forming a white powder similar to bran, while underneath the skin is perfectly sound and healthy; when, from any renewal of the exciting cause, it returns again in the form of a red surface or efflorescence, which ends as before.

The most common of the varieties of herpetic tetter are the following:—The pustular tetters, which begin in a distinct form, but frequently run into a cluster, and become confluent; at the beginning the tetter contains a thin, watery serum, changing to yellow, forms a thick crust, or scab. After it has existed some time, the matter of the tetter becomes acrid, the scab is lifted up before the granulation has taken place, and the parts underneath are ulcerated. This description of

tetter is very troublesome, as it often attacks the face, and forms amongst the hairs of the head, where it is excessively disagreeable. The miliary tetters frequently break out indiscriminately over the whole body: they appear in clusters, and sometimes in distinct rings or circles; they are very minute, and have obtained their name from their resemblance to millet seeds; they are a separate and distinct kind of tetter, and contain a particular clear lymph, which, in the course of the complaint, excretes on the surface, producing distinct scales, which at length fall off, and leave much inflammation below. The itching also, in this particular tetter, is very troublesome, and the discharge from the pimples is very tough and viscid—causing most of the substances applied, to adhere to the parts, which are afterwards, with much difficulty, removed. We have said, there are a great variety of distinct genera of tetter, but as those above-named are what most commonly affect invalids (and the other descriptions are frequently so formidable that professional aid cannot be dispensed with), I shall, without considering the other species of this disease, speak of the means of prevention and cure.

We are now come to a more agreeable part of our purpose, which is to point out a probable

means of prevention of this annoying complaint. If any person in good health should, on reading this chapter, be disposed to imagine that I have given this subject more importance than it should seem to deserve, I can only say that such opinion, not being founded upon a sad experience of the complaint, would deserve but little attention. Those who labour, or have laboured, under its ravage, will attend with eagerness to everything that can be said, that tends to explain the pathology of their sufferings, the method of prevention, or remedies for the cure. There is scarcely anything, to the female part of the species, more truly destructive of good temper and human happiness than this peculiar complaint.

We have said, that the whole surface of the skin is a living texture of secretory organs. When this tissue receives its healthy, nervous stimulus, its function is in unison with all the secretory mechanism of the animal economy; but acted upon by morbid stimuli, its secretion loses its salubrious character, it becomes acrid and poisonous: and that this is demonstrative as matter of fact, we have only to give in evidence a description of a particular tetter, which, from its poisonous ulcerative quality, has obtained the name of *herpes exedens*, or corroding tetter. When the tetters first come, they

exhibit small painful pimples, which soon ulcerate, collect into spots of various sizes and figures, always accompanied, more or less, with an erysipelatous inflammation; they very soon secrete a quantity of very thin, sharp, and truly poisonous fluid, which, increasing in acrimony and power, spreads along the neighbouring parts, and produces deep ulcerations. It will sometimes not only destroy the skin and cellular membrane, but even the muscles,—forming a structure of secreting surface, which, when taken up by the absorbent vessels, produces hectic fever, and occasionally death. We suppose this will afford sufficient evidence that a disturbed function of a secretory surface, when assuming its morbid character, is capable of producing effects truly alarming, and much to the detriment of all comfortable existence.

The first measure of prevention which the author would suggest, is dietetic. Avoid all animal food that has been long saturated in fluid having muriate of soda for its base, or what is commonly called brine; as, by these means, all the nutritious animal juices are extracted, and immediately enter into chemical combination with that fluid. The quantity of animal food taken should be very moderate, and must be of a very nutritious description. Neither

lamb, veal, nor pork, must be eaten; but beef or mutton, either roasted or broiled. The indication in view, is to enable the secretory organization of an extended surface to resist ordinary stimulus. Farinaceous food, as being very nourishing and of easy digestion, should be chosen; all fermented liquors, having in any way alcohol for its base, must be avoided. The food in general should be of a light and wholesome description, with a tolerable proportion of fresh vegetables; it being found, by experience, that those vegetables which contain a native acid, as oranges and lemons, give strength, and, at the same time, diminish the morbid irritability. It has been remarked, that fermented liquors, which contain a considerable portion of farinaceous gluten, have been useful, such as ale, spruce beer, &c. It has been observed, also, that a moderate proportion of fluids which contain carbonic acid gas, taken when in the act of effervescence, such as cider, soda water, &c., by its invigorating quality, has given power to the secretory surface. Another method of prevention, of much efficacy, is friction upon the surface of the skin, and ablution with a large sponge and water: the friction should have sufficient power to excite a moderate glow, or a sense of heat, upon the skin. And

wherever there is a predisposition to pimples or tetters upon the surface, shell-fish should be avoided. Water-cresses, and the stem of the lettuce, as possessing both sedative and tonic powers, have their use, when the indication of prevention is chiefly in view.

The next thing to be noticed, is the method of cure to be adopted, when measures of prevention have either been neglected, or have been found inefficient. As the cause of this affection has been represented to arise from a specific state of the nervous system acting upon the extremities of the vessels, whose function is secretion (if this view of its pathology be correct, and experience will confirm its value), the indications here will be, to endeavour to preserve a kind of balance of sensation—to keep every passion as much as possible in subjection to the judgment. The remedies, in a medical view, must be those of the Hunterian theory of counter-irritation. The acrimony of the secreted fluids will best be destroyed by small doses of antimonial powder and sulphur taken in black currant-jelly, every night and morning, or in conjunction with what is commonly called Plummer's Pill, alternately. The local applications must be governed by circumstances; all the dried incrustations should be very carefully removed, and mild solutions

of the metallic oxydes should be employed to diminish the acrid nature of the discharge. A strong decoction of poppy may be used now and then. The infusion of oak-bark has been found very useful in neutralizing the activity of the secretion, and in promoting the scabbing. Small doses of the acetate of potash, by acting as a diuretic, have occasioned an outlet for the accumulated animal salts, and, in many cases, have caused amazing, and in some instances almost instant, relief. Several prescriptions, containing the above-mentioned medicines, appear in the last chapter of this Manual.

CHAPTER XXI.

The Hypochondriacal State.—Its Connexion with Insanity considered.—Prevention and Cure of various Morbid Affections of the Mind.

In giving a physiological detail of the functions of any particular organ, it is very difficult to adopt a plan which shall not be liable to manifest inconveniences. The powers and actions of the animal economy are so complicated, and have such a mutual dependance upon each other—such varied connexions, and reciprocal influence,—that they cannot well be understood or explained, to the satisfaction of either the writer or reader, in a separate state. In this view of our subject, our body may be compared to a circular chain of powers, in which nothing is either first or last,—nothing solitary or independent;—for wherever we begin, we shall find there are prior functions which claim a right to be taken into the account in the production of the phenomena before us. And here it is very

proper to keep a check upon ourselves, in order that we may not be led captive by our imagination, in mistaking the regular sequences of things for their proper antecedents. We must take care not to mistake a fine theory for a collection of facts; because we cannot be ignorant that many of the received hypotheses of physiology are built on very loose foundations, and liable to very weighty objections. We must not conceive that the Almighty Architect, both of matter and of mind,—who governs and directs by unerring wisdom all the minute processes of nature,—has permitted us to develope all the laws upon which the intellectual powers of man may be said to depend. We must, therefore, not pass off our fine theories, and, perhaps, silly conceits, for his infinitely wise and extensive views: this would be, not explaining or detailing what we in fact are, but what we think we ought to be, or should have been. This would, without question, be a virtual piece of presumption, that ought to move the indignation of all persons who regard the works of nature with that humility and awe which the importance and dignity of the subject requires. The writer, therefore, would repel the imputation of ignorance, when he is treating of questions of an abstract nature, and

where, from the very nature of the subject, the pretension to much knowledge would be extreme folly. The most intelligent physiologists are aware of the great difficulty which surrounds many of the most considerable questions relating to animal functions: for instance,—sensation, motion, respiration, digestion, generation, and, last, though not least, the functions of the brain in the process of thought; with all the varied and complicated machinery of the intellectual faculty, &c. It has always been my opinion, that these laws of the animal economy have been much less understood than is usually imagined: our vanity deceives us, and persuades us that we have obtained the whole as soon as we have acquired a smattering of natural knowledge. Upon this principle, different sects of philosophers and physiologists have endeavoured to explain animal functions by various theories, that have put unassuming science to the blush! A sound mind, in a sound body, has properly been considered as a very great blessing, wherever it exists; but there can be no question, that many gradations of insanity exists where it is probably little suspected. The most accurate anatomists have expended much labour in the dissection of the brain; very minute differences of form and arrangement

have been noticed with much industry and fidelity; but no corresponding knowledge has been obtained respecting the functions of this important organ. The brain occasionally has been found, in varied states of disease, without any determinate or corresponding mischief to the intellect; it has also become known, that insects, and other similar animals, whose cerebral organs are but little developed, appear to feel and to reason with some precision upon the facts which their organization presents. In the human subject, different parts of the brain have been found in a state of destructive disease: sometimes the mass has appeared dense and firm; at other times, watery and soft: both these states have been found in persons who have shown no symptom of insanity. And, on the contrary, many insane individuals have exhibited no evident token of deranged structure of the brain, when examined after death. In this benighted state of our knowledge of the primary movements of life, it is most difficult to separate the essential from the accidental state.

A late writer has astonished the philosophical reader upon the subject of insanity, by asserting that madness, or insanity, is inflicted on human beings by Almighty God, as a punishment for their sins. For my part, I consider

insanity in the nature of a diseased function of the brain, and have observed, what I have considered very wicked and abominable characters, who have shown no sign of madness—unless, indeed, their being wicked should be admitted as an *à priore* evidence of their being so; and, on the contrary, other persons, who have observed all the decencies, and religiously performed all the duties, of life, have become the unfortunate victims of this malady. We always lose our discretion, when we arrogate to ourselves the office of a cabinet counsellor to the Supreme Being, and attempt to account, religiously or morally, for his inscrutable dispensations.

With respect to the hypochondriacal state, and its connexion with insanity, many and varied are the opinions concerning it; while the thing itself is allowed, by all persons, to be, in matter of fact, the most calamitous that human nature can bear. That it is accompanied with, if not caused by, a disordered function of the brain, is consistent with all the symptoms of the malady itself. Although it has been observed, that madness may exist where there is no apparent change in the structure of the organ; yet it is certainly true, that the structure of the organ cannot be diseased, nor its functions disordered, beyond certain limits, without the total obliteration of

all the intellectual faculties. The knowledge which dissection affords, is conclusive that the vascular system of the brain exerts an immediate and a despotic influence over its functional powers. A very small increase to the force of the circulation through the brain—any trifling increase in the vascular action of its coverings,—produce great disorder in its function; and a very slight degree of pressure in the great blood vessels completely suspends the relative functions,—thus producing stupor, stertor, and all the concurring symptoms of an apoplectic attack. Hypochondriasis seems to be more immediately concerned with the liver and abdominal viscera. Mania is a state of the mind, in which that mind is not master of its functions, but receives impressions from the senses, which are very different from those produced in health; it is a species of insanity, in which the perceptions are vivid, and the ideas thereby caused are decidedly more intense than external impressions; it is marked by great incoherence and raving, with a resistance of the passions to the command of the will, and often a furious resentment at restraint. Its causes are very various; but it is known to be occasioned by affections of the mind,—such as anxiety, grief, love, religious terror. Any passion followed with enthusiasm, by wholly absorbing

all attention, and destroying the balance of mental power, will induce a disturbed function of the brain. Two particular temperaments or constitutions are predisposed to insanity, viz., the melancholic and the sanguineous. The delirium which arises from fever, is an aberration of a particular kind, and generally subsides with the cause. Violent exercises, habits of drinking, the suppression of periodical and occasional discharges and secretions, are mentioned as remote causes; and likewise this affliction has been found to be hereditary. To the philosophical inquirer into the physiology of the human mind, many facts are developed, in melancholic patients, of a most curious and inexplicable description; for instance, they often indulge a most inveterate malice to particular persons, and those often their nearest relatives and friends, and to whom, before their calamity, they were known to be most ardently attached. They have also a most inveterate dislike to all places, either in town or country, which formerly gave them particular delight. There is also a very marked diminution of the irritability of the human body. This malady attacks patients at different periods of life; but, in a great number of cases, it makes its attack between thirty and forty years of age. There seems to

be some morbid analogy between hypochondriasis, the hysteric passion, and insanity; for there are a greater proportion of young females subject to it, than either males, or women more advanced in life.

It has always appeared to me inconsistent, to term insanity a disease of the mind. How can we imagine any disease of the intellectual faculty, that does not proceed from the material organ? This is a very important branch of human pathology; and it is very necessary to acquire correct ideas respecting it. All mental processes must be the function of the brain. In many animals, which possess only a small part of the human cerebral structure, sensation exists, and, in many cases, appears far more acute than it exists in man. What employment shall we find for this superabundance in the human species? All analogy in the pathology of the diseases of other organs gives a comparative credit to the principle, that all the various forms of insanity, that all affections comprehended under the generic term of mental derangement, are only evidences of an affection of the structure or function of the brain. When the biliary secretion is increased or diminished, suspended or altered, we have no hesitation in referring it to changes in the condition of the liver, as the

immediate cause of the phenomena. We can, and do, explain the state of the respiration—whether slow, hurried, impeded by cough, spasm, or any other cause—by the various conditions of the lungs, and other parts concerned in breathing. The state of the urinary secretion is always referred to the state of the kidneys, and indigestion to the state of the stomach; without having recourse to a vital principle, of which we truly know very little, and which, to a great degree, has eluded the research of the most curious. In many cases of insanity the affection of the cerebral organ is not strongly marked; often slow in its progress; but generally sufficiently specific to be known as the proximate cause of the diseased manifestations. What other supposition can explain or account for the increased or diminished energy, or the altered nature, of the various feelings and intellectual powers? Anatomists have carefully examined the heads of a great variety of insane patients, and, with few exceptions, have discovered obvious marks of disease: in some cases, loaded blood-vessels, increased serous secretions; in other cases, unequivocal marks of present or past increased action, depositions of coagulable lymph, watery effusions, and sometimes abscesses. In addition to this,

the insane often become paralytic, and are sometimes destroyed by apoplexy.

The physiology of the human mind is at present in its infancy; yet probably the sound or unsound mind may, in some measure, be appreciated by the rapid or slow succession of ideas. But, it will be asked, how are we to distinguish this increased, proportionate, or deficient activity of mind? We have no other rule of judgment, except from language,—the medium through which all our thoughts are conveyed. Thus we happen to know, that many insane persons are frequently talking to themselves, more especially when their minds are intently occupied; and their internal feelings do appear to be so very vivid, that it absorbs all concern for the objects that surround them.

We shall now enter upon a miscellaneous account of many of the causes, and most of the symptoms, of the disease.

But before I enter upon a miscellaneous account of many of the causes, and most of the symptoms, of the disease, I cannot but observe what an elegant satire upon the follies and eccentricities of all descriptions of persons is written by Horace, in the third Satire of his second Book. Horace would make it appear, that no human being

can, philosophically, be described as in a sound state; that we are all mad alike, differing only in degree; some rendered insane by the possession of wealth, and some driven to despair and madness by the want of it. All the caprices of humour and feeling, the desire for the gratification of all factitious wants, all fastidiousness, even such as is created by the enjoyment of picturesque beauty, is subject to the irony of this elegant writer, as certain signs of madness and insanity.

The most numerous among the list of causes of the alienation of the human mind from the sane state will, I think, be found in false views of religion, and in superstitious terrors of the Deity. In ancient times, it is well known, that priests had a most undue ascendancy, not only over their population,—to which they were the spiritual guides,—but also over kings, and the powerful statesmen of the earth; and they did not fail to tyrannize over the consciences as well as the bodies of men, which they directed to their avarice and ambition. It is impossible to read the varied superstitions, miscalled the religion of good will and charity, without being disgusted at the abominable ends to which it has been perverted. What have not the common people been made to believe? things which ought to

have been incredible, because they are impossible. In almost all these religious superstitions you will find, that the parties first affected are rude, ignorant people, uninformed of the laws of nature, and of the animal economy; nervous ladies, and aged people, are frequently victims to this malady, often the result of fear. The history of superstition, without doubt, claims alliance with all the errors and delusions of ignorant credulity, with those of witchcraft, demoniacal possession, oracles, and divination; and these are subjects by no means unworthy the consideration of a medical philosopher, and most especially of him whose peculiar office it is to administer to the health, and console the minds of the distressed and diseased.

Upon this most interesting subject, information from every source merits grateful acceptance; but it must often be sought for where ordinary inquirers are either unable, or too indolent, to look for it.

Many of the ecclesiastical writers have had a deep interest in perpetuating a system of mental delusion, having superstition for its basis;—the carved images of saints and angels, which have adorned, and still do adorn, the walls of many cathedrals, churches, and other religious edifices; all the elegant religious missals, emble-

matical pictures, and portraits; tend to render vivid fanatical impressions, by giving them a tangible shape and character. These are the sources of the mental delusions which have given rise to stories of ghosts, spectres, and apparitions; and in minds thus excited by very high-wrought embellishments, their prototypes may be as determinately fixed as any familiar object which may be found in nature.

The descriptions of madness in which spectral appearances are leading symptoms, are in close alliance with the system of demonology, which was once taught in the nations of Europe: the prevailing tenets of this superstition may be traced to the Jews; and probably the enthusiasm of the early Christians rendered them easy of belief upon the subject. But the thing was perfected by our early communications with the Moors of Spain, who were the chief philosophers of the dark ages. Toledo, Seville, and Salamanca, were the great schools of magic. Cornelius Agrippa, the luminary of the age in which he lived, united demonology, magic, necromancy, conjuration, with astrology; and this was the philosophy of his age. We may ask, with Horace, was not this man mad? or, rather, was not insanity the epidemical disease of the age? The ancient schoolmen taught,

that all knowledge and power might be obtained from the assistance of the fallen angels: they were believed to have skill in the abstract sciences, as they were called—in the knowledge of the various languages of mankind—in alchemy —in divinity, magic, history, and prophecy: they were supposed to influence the winds and the waves, raise earthquakes, dispense diseases, or cure them, induce mania and melancholy, or direct the power and objects of the sexual affections. This is in part a description, and a detail of the practical effects of demonology. As enthusiasm and hope created in the heathen mythology a variety of gods; so fear, superstition, and despair, created delusions of intellect, personified into spectres and demons.

Burton, the author of the "Anatomy of Melancholy," was a very learned man in his time. He was, however, a very bad pathologist. The laws of health and disease were not so well understood in his day, as they are at present; instead of ascribing insanity, and the various species of it, under the denomination of melancholy, to pure physical causes, he allowed a very great latitude to the operations of the devil. He says he "goes about like a roaring lion, seeking whom he may devour." At present a man, tolerably well informed, will have

much less to fear from the same cause, than Burton appears to have had.

It is curious to observe how much more intelligent the Greek writers were upon the causes of this calamity, than the writers of the middle ages, who came down to us, for the most part, strongly tinctured with the superstition of monkery and priestcraft. The ancient writers were very accurate observers of symptoms, and were very unwilling to commit themselves in accounting for them. This renders them very valuable in all researches having the philosophy of the human mind for their object. Pathological researches into the causes of the alienations of mind may be applied to the solution of far more important questions than those which belong to apparitions and spectral impressions; yet a knowledge of these may materially assist the physician in his treatment of the mental afflictions to which our humanity is liable. The moral philosopher may likewise be taught, by the same laws, certain very important principles, influencing human actions and conduct, upon which doctrines of the very highest value to the science of politics and morals, may be very securely built.

The causes, both of hypochondriasis and of insanity, are many in number and various in

their character: they may, however, be properly enough classed under two specific heads, viz. physical or moral. The causes which are commonly called physical, as inducing hypochondriasis and insanity, will hardly admit of dispute, and must be referred to visceral organs, or to the brain. When vascular action produces a high degree of nervous excitement, the symptoms are sufficiently clear, and remedies are easily chosen; but when anxiety, grief, love, religion, terror, or abstruse study, produce an aberration of the intellect, and, at the same time, the arterial action is perfectly quiet, perhaps quite free from any febrile disposition, the connecting medium of influence is by no means so evident, although the facts are certain. All mental consciousness that produces strong nervous excitement, and all intense emotions which have a durable influence upon our selfish and social dispositions and habits, have, by consent of language, acquired the term of moral. It is extremely difficult for the imagination to connect the phenomena of thought with the movements of matter, and some philosophers have considered them as wholly independent. The fact of their union must be received as true by a curious observer. John Locke has long ago declared, that the organs of sense are our sole

inlets to knowledge, and beyond that, the sphere of mental action does not extend. Internal sensations, produced by diseased action, are the sources of some of our ideas. The movements which are excited in the brain itself by external impressions, and which form a great variety of our ideas, occasion a change in that organ, more or less permanent. It will be perceived, that those causes of insanity, or mania, which are usually called moral, have, in reality, a physical origin; although the connexion between the mental affections and the organs from which they arise, or upon which their actions more immediately fall, is not always very perceivable. Love, jealousy, and maternal affection, are attached to the activity of particular parts, and are the necessary supplements of their functions. Different passions act specifically upon different organs: hence the passion of rage is a very frequent cause of apoplexy, or epilepsy, which ignorance and bigotry will sometimes attribute to the particular judgment of the Almighty.

The teachers of moral causes, though professing to believe that the passions are under the influence of the individual, always act contrary to this principle; for the passions, when excessive, truly become physical evils, and can only be cured or diminished by weakening the power of the man

by a vegetable diet, and by the loss of blood. Even avarice, that horrid evil, can alone be abated by representations of hopes or fears beyond the grave; and the sensual passions, by vanity or by fear. But, as life advances, many of the passions chase each other away, because they are inconsistent one with another; but the change in human conduct that results from this balance of our passions or their subsidence, is no evidence that we have enthralled them by our judgment; for most causes of insanity which are termed moral, are but re-actions of the mind upon itself. The omnipotence of external circumstances upon internal feelings discovers itself in almost every movement and action, both of the mind and body. There is an observation in the "Letters of Melmoth," commonly called "Fitzosborn's Letters," that tends to illustrate this position. He says, "It might, methinks, somewhat abate the insolence of human pride, to consider that it is but increasing or diminishing the velocity of certain fluids in the animal machine, to elate the soul with the gayest hopes, or sink her into the deepest despair; to depress the hero into a coward, or advance the coward into a hero." The very essence of all human laws, and all the codes of morals, are founded upon the invariable and necessary connexion of cause

and effect: all the facts of physiology are obedient to the same law; for the brain is either useless in all that relates to the intellect, or the functions of the mind are governed by the laws of organized action. But organic action yields obedience to its own peculiar stimulus; nor can such obedience be refused, whether the effects are wholesome or destructive: the brain then acts from necessity, from the causes which excite it; whether they promote health or lead to madness, consequences form no part of the argument. This is a position founded in truth, and of intense practical value. In the delirium of fever, of acute insanity, or of intoxication, the increased excitability of the brain prevents the fixation of the ideas. The law of association appears to take place too fast for any clearness of perception; impressions and ideas follow each other in a manner tumultuous and indeterminate, and with a vividness which causes the party to be insensible to external impressions. This forms a peculiar species of mania. Can we hesitate to acknowledge that the brain is a material organ, like any other animal viscera, obedient to the laws of its peculiar structure? And with respect to the formation of particular inclinations, we must not found our opinions upon metaphysics, but upon physiological data. No two

faces were ever exactly alike in their lineaments; there cannot, therefore, be expected any two minds to be in perfect conformity. We find predispositions, not only in a mental and moral point of view, but morbid predispositions to particular diseases, to which some are easily susceptible, while others are totally exempt. Hereditary tendencies to certain diseases, in certain families, is constantly confirmed by experience. Thus, the chronic state of mania forms the last link in the intellectual scale. There is almost always found, on dissection, in this disease, a visible change in the structure and texture of the brain. Thus the pretensions of the universality of genius cannot be allowed; and in the present state of our knowledge they would be of no avail, but to cover the claimant with ridicule and contempt.

The doctrine of peculiar susceptibilities, in a philosophic, and even in a physiological view, is well worthy of inquiry; for it is well known, that each individual of our species has a particular susceptibility from the nature of organic structure; nay, often the different organs of the same body are found to be liable to great variation; and this fact probably takes place from the extent of influence imparted by the brain and nerves to the various organs of sense

in the animal economy. The *modus operandi* of the whole nervous system is so involved in mystery, that there is no proposition, however improbable, that might not be founded in nature, nor any with apparent high probability, which may not be established in truth. The circumstance, however, is certain, that a great constitutional variety of susceptibilities is evinced in the several organs of the body, but they greatly differ in various people.

When the human mind, in a state of health and alienation, is the subject of inquiry, it would be a curious research to observe, with attention, the occasional causes on which the human mind, and its susceptibilities to social affections, are manifested; for all the moral propensities and dispositions of man depend upon ultimate laws, determining on what definite occasions of social intercourse various degrees of vividness should be dispensed to the feelings of the mind. A late writer, highly valuable and philosophic, has classed those definite occasions, as connected with acquisition or privation—1st, Of knowledge.—2d, Of power.—3d, Of society.—4th, Of the means of evincing gratitude.—5th, Of the means of resentment.—6th, Of the esteem of our fellow-creatures. The list of definite occasions might be very extensively increased; but it is

fully sufficient to illustrate the principle, that a sense of the acquisition of any of these objects is in each individual attended with a more or less vivid degree of pleasure; and by the same law, a sense of the privation of any of them is attended with a more or less vivid degree of pain. It is in conformity with this theory of facts, that the definite occasions of hope and fear have such universal and powerful influence upon the human mind, and upon which our prospective views of happiness or misery so much depend.

This discussion concerning hypochondriasis, mania, and melancholy, appears to me to have a very intimate connexion with our subject—and they are maladies which, if detected in their incipient state, may, by a judicious mode of treatment, be often averted. It has been said, that, in the middle ages, the most absurd opinions existed upon this calamity, and also upon all the other kindred affections: epilepsy was supposed to be the work of the devil, and to require exorcism. Apoplexy, instead of being the result of known and natural causes,—of which, indeed, the Almighty, as the Cause of all things, must be the Author, but assuming the intervention of a special and particular dispensation of his providence,—was said to be caused

by the visitation of God. That beautiful allegory, in the Book of Job, by being interpreted literally, has greatly confounded the progress of natural knowledge, and substituted in its place the horrible opinions of the influence of demons, evil genii, and witchcraft. And we know, that Sir Thomas Brown, of Norwich, the author of the "Common and Vulgar Errors," and also of the "Religio Medici," was subpœnaed upon a trial for witchcraft, before Judge Hale; and he, in the witness-box, gave an elaborate, and what was then thought a most learned, detail of the nature of witchcraft, the various powers of witches, how they are to be known, and their various descriptions. It is needless to say, after so much learning, that the jury admired his wisdom, and found the prisoner guilty, and that the learned judge left her to suffer death according to law!

As a proof of the truth of the assertion, that the Greeks, about the period of the Christian era, had a far more scientific knowledge of insanity than what existed many centuries afterwards, it is only necessary to attend to Aretæus, a very celebrated Greek writer, and a most accurate observer of symptoms; although, from the little progress that human dissection had then made, their knowledge of anatomy was

very limited. From this circumstance, Aretæus is now and then perplexed to explain phenomena which we still observe to be faithful copies of nature; and, from the abstract and recondite nature of the functions of the brain, are not much better accounted for by the moderns. A detail is here given of some of the symptoms which he enumerates.

"A settled despondency takes place as quick as thought, attended with no fever; and melancholy appears to me, not only to be the beginning of, but to constitute a part of, mania. The mind of those who are under the influence of mania, is sometimes affected with heat and passion; at other times, with folly and pleasure. On the other hand, such as labour under melancholy, are affected only with sadness and despondency. Besides, the former pass the greater part of their life in playing the fool, and in committing the most unseemly and atrocious deeds; but the latter do not labour under one species of disease only,—being often suspicious lest poison should be given them, or, hating society, they fly into the desert, and become superstitiously religious from an utter detestation of life and light; and if, at any time, they have a relaxation from their despondency and distress of mind, pleasure and

merriment generally succeed: those who are thus affected, hasten to mania.

"Men are affected both with mania and melancholy;—women are more seldom liable; but the affection, when it takes place, is in a stronger degree. The period of life subject to it is manhood, or that which approaches to vigour; the seasons which produce the disease are summer and autumn, and the spring gives the crisis.

"The following are some of the more evident marks of the disease, or affection:—The patients are quiet or sad, dejected and dull, without any evident cause; melancholy too begins, when it is impossible to assign a cause; besides, they are passionate, ill-natured, wakeful, and raised out of their sleep in very great confusion. Great terror likewise seizes them, if the disease increases; at which time their dreams are frightful, clear, and wearing an appearance of truth. Whatever they pursue with ardour, is easily repented of; they are changeable, shameless, anxious about trifles, covetous; and soon after, they are simple, profuse, lavishing what is in their possession;—which proceeds not from any virtue of mind, but the variety and change of the disease. But if it still comes to a greater height, they hate and shun society; they com-

plain of things the most trivial, curse life, and covet death. The mind, likewise, of many, borders upon a state of total insensibility and infatuation; insomuch, that they are ignorant of every thing, forgetful of themselves, and lead the life of beasts. They are thin and meagre, notwithstanding their voracious appetites; for sleep contributes nothing to their meat and drink in giving strength: their wakeful disposition carries every thing outward, and dissipates it insensibly: they are greatly troubled with flatulency in the præcordia. Their pulse also, for the most part, is small, dull, weak, frequent, and has a sensation of cold."

These are the symptoms which, among many others, this ancient Greek details. With respect to remedies, he principally relies upon hellebore as his sheet-anchor; and this gives us a clue to his pathology:—the liver was considered by the ancients as the most important organ of the animal economy. The morbid function of this viscus was known to have great influence in the production of hypochondriasis, so nearly allied, in appearance, to insanity: they seldom admitted of any remedy as effective, that did not expel what they termed the black bile from the system. Hypochondriasis is occasioned by some imperfect actions in the organs of assimilation:

disturbed functions give the exciting cause to the most anomalous symptoms in this complaint: undue excitement in the vascular and nervous system, superadd to these symptoms morbid perceptions, which form an alliance with insanity. Its relief consists in proper attention to the alimentary canal; in removing as much as possible all causes of irritation from the nervous system; and in reducing the momentum of the blood—particularly in its circulation through the ventricles of the brain.

CHAPTER XXII.

The various Species of Tabes, or Consumption, considered.—The several Organic Affections inducing Hectic Fever related.—Tabes Dorsalis.—Tabes Mesenterica, with Rules of Prevention recommended.

This is a disease of too important a character to be overlooked in this Manual; as consumption is, without exception, the most universally fatal of all other diseases. It becomes a matter of great necessity to early detect the predisposing symptoms. That the most efficient means of prevention may be employed, it will be admitted as a rule,—liable, in my opinion, to no exception,—that in the exact proportion that a man follows nature, and is obedient to her laws, the longer he will probably live—barring casualties, which, perhaps, human prudence may be able neither to foresee nor avoid; and, by parity of reasoning, the further he deviates from these laws, the shorter will be his existence. I need only mention two of the most fertile causes of

premature death, and both not of an ancient date; —viz. the establishment of the African slavery in the West Indies, and that of hospitals for foundlings. The position could easily be illustrated, but the fact is indisputable: those who are well acquainted with these establishments, will instantly confess that mortality prevails in the greatest degree where the sacred laws of nature are despised, and where her first and strongest bonds are torn asunder,—where the little innocent is dragged from its mother's breast, and handed over, in utter helplessness, to the care of hirelings; and also where one brother is separated from another, from his home, his habits, and sent to a strange and to an unhealthy climate, where, without hope, he pines to death, oppressed with severity and labour.

These remarks are pertinent to our object, inasmuch as they prove, that on every other subject, as well as those connected with health, a knowledge of the laws of nature are essential, in order to avoid their infraction. From a more extended knowledge of the laws of the animal economy, many diseases,—and consumption, one of the number,—would be occasionally prevented, which are with such difficulty relieved, and which often terminate in hectic fever, and with

the consequent emaciation and derangement of all the vital powers.

The pulmonary consumption is by far the most frequent of all the varieties of this disease. In all high latitudes, the frequency, and often the fatality, of this malady is the source of grief and lamentation. It has been before observed, in this Manual, that causes and effects are both invariable and uniform in the production of disease, as much as in any other of the phenomena of nature; and they advance in a certain series, or train, of symptoms, which are of so unequivocal a character, that it is almost impossible to mistake them in the establishment of this disease.

Whether hectic fever, the invariable accompaniment of consumption in most of its varieties, be an idiopathic affection, as asserted by Galen, Hunter, and Dr. Robert Willan, it concerns us but little to inquire; the history of the symptoms, and the mode of relief, would be a more useful research, and to that I shall direct the inquiry. The late Moses Griffiths has written upon this subject; but, as it evidently appears to me, with a view to recommend his favourite medicine, rather than a discussion of the principles upon which this disease is founded, or any series of symptoms, on the appearance of which reme-

dies should either be employed or neglected, we shall derive no useful knowledge from his treatise. The incipient symptoms that indicate the approach of consumption are, at the beginning, very insidious. The first symptom that I discovered in a beloved daughter, was the breathing rather hurried; upon going up stairs, the palms of the hands rather warm, with a red circumference and pallid centre; the pulse afterwards increased in frequency and diminished in its fulness; the stomach very early sympathizing with the lungs, nausea and frequent retchings took place. There were chills upon the skin; the pulse was generally weak, but sometimes hard and wiry: as the disease advanced, she became querulous and impatient, the very opposite state of her natural disposition; a dry cough, without expectoration, that often struck me to be like a spasmodic paroxysm. She often assured me that her sufferings were not severe in respect of pain, but rather a sense of uneasiness and great loss of muscular power. The mental energy was also much diminished, but the nervous sensibility greatly increased; the sense of vision was more acute; the smallest sounds were audible. There was much uneasiness about the wrists, which she described as if her pulse ached; the tongue was usually of a florid

colour; the appetite was good through the whole disease, and the food appeared to digest well. The exacerbation of the fever generally took place about four or five in the evening; there always appeared an exacerbation after taking food; the paroxysms were marked by a sensation of burning heat in the palms of the hands and soles of the feet, which were red and mottled, and an occasional flush was on the cheeks; the excretion from the kidneys deposited a red sediment of uric acid. As the emaciation advanced, the joints of the fingers appeared to enlarge, and the nails became curved: the hair of the head became soft, like flax, and would come out by the bulb with the slightest force; and on the further progress of the disease the legs and feet became swelled, and the sphincter vesica lost its power of contraction; the brain became disturbed in its function by the general debility and febrile action, and delirium was frequent. During the exacerbation, the little patient seemed always to entertain hope of recovery, while the apparent certainty of her fate was evident to all. I have been the more particular in describing these symptoms, as it is not a theory, but a practical case, under my own observation, and where affection inspired so intense an interest, that no symptom, however trifling, escaped attention.

There are several varieties of *tabes*, or consumption. The species above described, was that of pulmonary consumption; but there are other varieties, which are called by different names, and which are classed by medical nosologists agreeably rather to the freaks of fancy than a distinction of nature. There is a species of *tabes* caused entirely by mental inquietude, or what is more commonly called nervous irritation, where no local affection or change of structure in any organ is discoverable; it appears to be kept up by an intense morbid feeling, which proves a constant stimulus to the heart and arteries, forming a species of hectic, which, if allowed to go on, will undermine the constitution, and the patient will be destroyed. This is the disease, which, from its peculiar character, has been called the broken heart.

The *tabes mesenterica*, is so named, because its local seat is among the glands of the mesentery: those glands become organically affected; they are changed in character and in function; the emaciation becomes very great, because the patient has but little nutrient chyle that can possibly pass, and the ravage of the hectic fever is advancing at the same time: it is attended, either more or less, with headache, languor, and want of appetite; there is an acute pain in the

back and loins, and a fulness, pain, and tenderness of the abdomen; the nutrient chyle appears rejected by the lacteals, and may be seen as a white fluid in the intestines. This description of consumption is more under the controul of remedies than the pulmonic, and frequently, if precautions be early taken, and attention given to the symptoms before the constitution gives way, the patient will probably recover.

The *tabes dorsalis* is a vague term, but little descriptive of the truth of facts: it has been supposed to be a stimulus of a peculiar kind, which has a specific power over the spinal-marrow, and all the parts which are supplied with nervous power from that source. In this description of disease, all the assimilating organs are injured by the stimulus of excess: the lungs, the heart, and the whole nervous system, are called into sympathy by this attack. A mild restorative diet, such as asses' or goats' milk, with whey, or butter milk, seems to be an excellent indication here: and, with regard to medical resources, mild aperients, vegetable bitters, and that class of tonics unconnected with stimuli. In this case, the restorative power of the air is the greatest auxiliary in the recovery of health. It is most essential that an invalid should be acquainted with the early

symptoms of these diseases, because on such knowledge will greatly depend the employment of those prophylactic means, which are by far more efficacious in averting, than all the resources of the physician are in curing, this description of disease. It is a circumstance very curious, that, upon the dissection of hectic patients, the heart has often been found to be both smaller and thinner than is usually found in other maladies. Whether it partakes of the general emaciation, or that it has lost its power, as having been the instrument of feeble actions, it is useless to inquire; nor will the fact itself lead to any useful practical result; nor would it have been named, unless to illustrate the pathology of the disease, as tending to show that it may be the cause of some of the phenomena which appear to be not naturally associated with the usual symptoms of the complaint.

Various causes have been enumerated as productive of consumption: the most general is, doubtless, the existence of tubercles in the lungs; but these little tubercles seem to have no power of exciting the disease, unless they become inflamed. The inflammation of tubercles is, therefore, the most early, and the most uniform, symptom of incipient consumption. Every thing, therefore, in the nature of excess, as productive

of debility, must be avoided; every intemperate habit must be shunned; every sudden vicissitude of the weather must be provided against. We should scrupulously regard every occurrence, which may exhaust the activity of the nervous system, or lessen its vigour. Scrofula, syphilis, and measles, are productive causes over which our attention to prevention can have but little power, and hence the very frequent mortality of the disease. With respect to scrofula, its affinity to consumption is, unfortunately, confirmed by facts, and experience of such a nature as we are bound to acknowledge; and there is but too much reason to think, that the enthusiasm of genius, as well as of passion, with a delicate sensibility which leads to a cultivation of the fine arts, have never been developed in greater perfection than where the constitution has been decidedly of a scrofulous predisposition, and which is often observed to be the precursor of pulmonary consumption. We have no certain proof that consumption is of a contagious nature, but we have abundant proof of its hereditary tendency: it will often occur that consumption will be a consequence of catarrh, as it will of any thing that gives an occasion to the deposition of tubercular matter, which renders the neighbouring parts very susceptible of inflam-

matory action; and this happens sometimes from very trifling causes.

The reader will perceive that my observations upon this distressing complaint have a reference principally to the prevention of the disease, because experience has but too strikingly evinced that the treatment of the most skilful physicians can only operate as a palliation of the most urgent symptoms; and if the attention of patients were early aroused at the approach of incipient symptoms, I am convinced that very many cases could be prevented from forming, that, after tubercular inflammation has taken place, would run their fatal course. As the readers of this Manual will scarcely trust to themselves in prescribing remedies, in respect of medicine, but rely upon some judicious practitioner, I shall conclude my remarks with some observations upon diet, which, if properly attended to, will go a great way in my grand pursuit of prevention, which, from what I before have named, is most to be attended to in a work of this kind.

The diet of those who have a tendency to consumption should have several indications in view: the principle of supporting the strength, while the vascular excitement and nervous irritation is great, requires very nice discrimination;

it certainly cannot be effected by heating or stimulant food. Milk has been found to be an animal fluid affording the most tonic sustenance, with the least stimulating quality of any thing that can be named. Asses' milk, taken freely twice every day, has often been recommended; but cows' milk, when it is found to agree with the stomach, is as good; and it is often made more capable of digestion by long boiling. But whey and buttermilk are often found to agree, even in some instances better than milk. Farinaceous food of all kinds, in its various forms, may be taken in addition to milk and eggs. Neither animal food, nor fermented liquor of any kind, especially wine, can be allowed. Milk boiled down with mutton suet has been spoken highly of; and if the hectic fever be not very active, the suet merits a trial; but we know that milk itself is an animal substance, when coagulated in the stomach: the suet will not much increase the stimulating property, and is well worthy of a trial.

In pursuance of the principle of prevention, a very important agent in its promotion must be the salubrity of the air to be respired by the invalid who has the misfortune to be menaced with consumptive symptoms. Moderate exercise in the open air,—especially riding,

sailing, and every variety of scenery,—must be allowed to be very useful, as cautions for securing delicate constitutions from attack, in habits predisposed to this disease, as it has been known to effect many apparent cures even in far advanced cases. In the writings of Van Swieten, we find that he recommended the lower order of patients, liable to this disease, and who were confined to sedentary employments, to endeavour to get situations as coachmen; and he says, that he is firmly persuaded that by this advice he has saved the lives of many. The English winter is generally a severe period for a pulmonic patient; and if the party have means, a removal from this country to a warmer climate would be very desirable; or even a removal to the most temperate parts of England would be of great use in incipient cases, at any period before the commencement of decided ulceration. There are peculiar localities, which are found by experience to be more suited to the nature of some maladies than of others: thus Kensington has a reputation of being a very proper residence for asthmatic patients;—perhaps rather from the peculiarity than the salubrity of its air. Penzance has long enjoyed a reputation of being a very eligible residence: its temperature may be considered as about $4\frac{1}{2}$ higher than in London,

in the coldest months; but there are many other parts which have a just celebrity: some parts of Hampshire, or the coast of Sussex, possess a very sheltered situation, and must be considerably less exposed to the north and north-east winds; and Hastings, or its neighbourhood, may be reckoned a very eligible residence for invalids. It is a matter of no small moment, to secure as much as we can an equability of temperature; because it diminishes the chance of incurring or aggravating pulmonary diseases arising from often taking cold. The greatest equability of temperature seems most likely to be obtained by a voyage at sea to a warm climate, in which the variation seldom equals half so much as the most favourable situation on shore; and in all incipient pulmonary cases, the motion of the ship would, without question, be more beneficial than otherwise. In the advanced stage of the disease it is injurious.

Attentive observation has ascertained, that the frequency of consumptions is much greater in cold than in hot climates; but not simply from the property of cold,—as consumptions are not by any means in an exact proportion to the depression of the mean temperature, although the cause may be recondite:—the fact is sufficiently certain to warn us, not to brave the result

of experience in a matter of so much importance. Indeed, a repository of facts, connected with the variations of temperature, deserve the utmost attention, as they relate to circumstances of continual occurrence, and of perpetual influence on our health and comfort. It is well known, that the indications of a thermometer, however truly observed in the most unexceptionable exposure, is not a safe rule, or a correct test, of the state of the temperature as it affects the human body; nor is it possible, by any means yet known, to relate the various modifications, produced by wind and water, on the temperature of the atmosphere. The philosophy of what are commonly called fogs, is very imperfectly understood: that dampness, which is called the dew,—notwithstanding Dr. Wells's Essay,—is as little known; nor will the thermometer throw light on the subject. Some contend, that the dew ascends from the earth; while others say, that it descends from the atmosphere. All believe, and justly, that both fogs and dews have a very powerful influence upon consumptive cases. Both heat and cold must be more sensibly felt where moisture exists; as, in the one, the perspiration will be diminished, and, in the other, the air will obtain a conductor which will make the sensa-

tion more severe. It must perpetually be held in remembrance, that the most fit and proper residence for all patients who have the misfortune to be affected with catarrhal or consumptive affections, is where warmth and equability of temperature can be combined, and most especially during the winter months. If these precautions were early attended to, it would avert such a mass of suffering as the pen can scarcely describe. Friendships would not be dissolved by death; nor would sympathy be called to deplore what science might have taught how to prevent.

CHAPTER XXIII.

Philosophical Commentary:—Containing a Review of Principles, for the Attainment and Preservation of Health, and the Promotion of Longevity.

From a retrospective review of what has been adduced, it will appear evident, that a certain state, or predisposition of organic structure, is essential to the attainment and preservation of health. There is a variety in the primordial stamina of different persons, which renders them more or less liable to be affected by external agents. Experience has demonstrated, that it is not essential to great duration or longevity, that the person should possess perfect health; for there are many instances on record, where the party has continually been subject to functional affections, and yet have lived to an extreme age. The human species differ very widely from every living creature with which we are acquainted—

not only in the complexity of their organization, but in being a party to which mind, and all intellectual feeling, so particularly belong. The bodily organs of man will soon cease to act in unison, unless his internal feelings correspond nearly with his external circumstances;—he is surrounded with many wants, but he has also a greater amplitude of means to gratify them than any other creature;—his being appears more expanded; his organization is very complicated and delicate; and his intensive life, and self-convincing powers, are, therefore, very great: his very existence appears, in a physical view, as little else than incessant change—an almost perpetual alternation of destruction and restoration! Fresh component parts are every moment collected from surrounding agents, called into life from an inanimate state, and transferred from the chemical to the organic and living world; which now lose many of their chemical affinities, and, in exchange, become subject to the laws of vital organization.

The public health is an object of great value; and yet it would, perhaps, be difficult to discover any thing in social life which is virtually more neglected. A very large proportion of the retail druggists of London, and other large towns, who keep open shops, are the practical

physicians of the poor, who too often try first the efficacy of the wine-vaults, and then the medical wisdom of the druggist: if neither succeed, they console themselves with having done their best, and things must take their course. It is a lamentable fact, that tens of thousands of human beings are consigned to the grave before they reach three years of age; a great part of whom might have been preserved by skilful practice. The opulent classes of society, in this country, are very benevolent; but their bounty will never much benefit the people, unless they receive sufficient knowledge so as to create a sentiment of gratitude, which is essential to a correct moral feeling. The public health, and the public morals, should be the objects of the greatest solicitude on the part of every government, instead of extracting a profit to the revenue from ignorance and vice. Quackery, and quack medicines, of almost every description, should meet reprehension and punishment, and not receive legal sanction by a stamp duty. Ignorant druggists should be fined or imprisoned by the magistrates, for presuming to obtrude their advice and medicines for profit; it should be considered as a misdemeanor, and punished in the same way as obtaining money under fraudulent pretensions.

They should be prevented from dispensing the prescription of either physician or surgeon,—it being well known, that they are but too often grossly ignorant of the Roman language in which such documents are usually written, and which has placed in imminent peril many a valuable life. Until these reformations take place, the Apothecaries' Act of Parliament will be useless, as regards the public interest, however anxious that body of men (many of whom are well educated and most respectable,) may be to carry its provisions into beneficial effect.

Another dreadful obstacle, both to the public health and public morals, is the process of distillation. Many have been the blessings of science to mankind; but the workshop of the distillery is the elaboratory of disease, and of premature death. The manufactory of gunpowder, and the art of distillation, will form dreadful items in the set-off account of human happiness. Spiritous liquors of every description, taken as a beverage, are decidedly hostile to the healthy functions of every vital organ; it demoralizes the man, it increases the number of his wants, while it paralises every energy by which he can relieve them; with the concentrated power of the stimulus it contains, the momentum of the blood is accelerated through

the vessels of the brain, and a train of ideas by inebriety are produced, equally destructive to health and moral principle. Notwithstanding, so very inconsistent are persons, whose judgment every hour convinces them of the truth of this statement, that inclination and habit are generally the guides to be followed, even with a perfect knowledge of all the inevitable consequences.

Surely, if we persevere in habits (in defiance of experience) which we know to be destructive to health, and productive of death, what can exempt us from the imputation of moral suicide? The stoutest among us has no great predilection for this king of terrors. We none of us can form any correct thoughts of what new scene may open upon us in the world to come; our present affinities, affections, and kindred ties, every thing we value or enjoy, appear to us to be despoiled by death, never to be enjoyed any more. The more fortunate we are in our connexions or circumstances, the greater will be our compunction on that account. The reflection on death can alone be agreeable to him who employs it as a motive for an amended life. In general death strikes terror, more or less, into every person. For as every one is intensely fond of his own particular happiness, in the

same proportion will the event be deprecated, by which he expects to lose it. Those individuals whose practice through life is in constant violation of nature's laws, in regard to health, may be said to burthen themselves with all that is most heavy and hard to be borne; to separate themselves in this world, by an eternal absence from every thing which they esteem and value: all their tumultuous sensations end in relaxation and fatigue; all their pleasures have ended in anxiety; and all their nectar is secreted poison: they sever the thread of life, regardless of the admonitions of their conscience, or the pangs of disease: the measure of their folly and guilt is complete, and their last action is *felo de se*.

The attainment of health presupposes its prior deprivation; but under any circumstances of this calamity, it is at least comfortable to be convinced, that disease has also its laws of action, which, for the most part, proceed with a uniformity sufficiently regular to form a just datum of observation and experience, by which it may be well known and safely relieved. The object of the medical art is to attain and preserve health: the means of attainment must be different under varied circumstances, and must be regulated in obedience to known principles,

the present condition of the patient, and the specific nature of the remedies to be employed. The medical art is apt to consider every disease as an evil, which cannot be too soon expelled; but experience proves, that often one disease is productive of another, and these conversions are frequently so regulated, as to prove salutary processes of nature. The aberration from the condition of health is sometimes so gradual, and the remote causes so subtile, fugitive, and evanescent,—they combine in such various degrees and modifications, as frequently to elude the most diligent scrutiny. The science of pathology, and therapeutics, though taught upon general principles, must be practised, therefore, by the standard of the practitioner's ability; and both success and failure will occasionally occur, not only according to the acquirements, but also to the precision of ideas and natural talent, of every practitioner. There is a very great absurdity generally prevalent, viz., that all diseases have their specific remedies in nature, if the physician have sufficient capacity to enable him to discover them. Almost every internal affection is considered as curable in itself, if the science were extended to its utmost perfection; but the experienced practitioner is convinced, that old types of disease gradually

disappear, and new forms are daily arising, in conformity with the state and condition of morals and manners in the progress of civil society.

The author has before mentioned his conviction, that ignorance is the fruitful parent of error and misery, in every thing connected with the well being of man. Fatal errors are often committed in common life, by the habitual practice of attributing effects to wrong causes; and it cannot be too often repeated, that if ignorance be imbecility, privation, and suffering, its effects are never more terrible than when it respects the management of health, and the various affections and accidents of the human body. It does appear strange that pathological and physiological science has not been more justly appreciated, in proportion to its intrinsic value: but the causes may be easily explored. In most investigations the first steps are attended with great difficulty—every thing is strange and unknown—facts appear insulated—and, while we continue in health, quite uninteresting. It is the sense of uneasiness that determines the will: we look upon health as our due; but when assailed with illness, we immediately become curious concerning its cause—but *nil sine magno labore.* "There is no royal road" to

a knowledge of the principles upon which health depends; it is not till after the lapse of much time, and considerable industry, that any valuable practical information upon this subject can be obtained; and in the research for truth, upon the matter of health, the inquirer has but too often to deplore the imperfection of sounds to communicate thoughts: words are mistaken for facts; and ideas and philological learning become the substitute for pathological knowledge.

As the stomach is the grand recipient of all the nourishing substances that are introduced into the system, it is often the first organ that announces the attack of ill health; for whatever is not susceptible of decomposition by that organ's living agency, may practically be considered as poisonous: it will certainly excite such a disturbance in the functions of the intestinal canal, as to place the life of the person in great danger. In the processes of both health and disease, we are continually looking around us to develope final causes; and we too often amuse ourselves with the hope that we have found them: and with respect to the function of the stomach, in particular, as connected with disease, it may be truly said, "that what is one man's food will prove another's poison." It is so flattering to

human vanity to imagine that we have discovered all the purposes of our Maker, in relation to our existence—the idea of intention, even in disease, agrees so perfectly with our usual modes of thinking, that the language we use, as explanatory of our ideas, assumes as a fact our knowledge of final causes; although it would be more creditable to our modesty to acknowledge that but little upon this recondite subject has hitherto been permitted to be known. Thus, many substances, poisonous in their own nature, are often introduced into the stomach, which become perfectly inert and innocent when acted upon by the living power of that organ. Many animal poisons—as the secreted poison of the serpent, or scorpion; several morbid poisons, as the poison of cancer, syphilis, and also of hydrophobia—can be taken into the stomach with impunity, because its texture is not favourable to the developement of its deadly character. Likewise almost all the vegetable poisons that exist, in their natural state are in combination with sugar or mucilage. This circumstance, under a different arrangement, would greatly increase the danger, by the temptation which it would afford to the palate of ignorant persons and children; but the stomach subjects

it to decomposition, and it passes through the alimentary canal without excitement, or causing the least inconvenience.

Health is often preserved by due attention to the articles of food, air, and exercise; errors in these essentials seldom escape with impunity. The sin of gluttony is but too frequently similar to that of ingratitude—the crime is continually committed, but the guilt never avowed. The stomach, in civilized society, is frequently made the great inlet to disease; the bulk of mankind are divided—into those who have not enough, and those who have too much, for the support of life; each party is sure to pay the penalty of the want of adaptation in circumstances to their physical wants; but in estimating their respective pains, we must always consider that those of the rich are voluntary. An elegant and intelligent writer says, "There is a decent gravity about the sin of gluttony," which agrees well with the hypocrisy of professional life, while its enjoyments afford some compensation for other indulgences often deemed incompatible with a reverend character. *Cease eating while your appetite exists, is the rule of health; for satiety, both moral and physical, is the grave of all*

pleasure and enjoyment. Doctor Armstrong has published, in his "Art of Health," some beautiful lines upon this subject:—

"Voluptuous man is by superior faculties misled,
Misled from pleasure, even in quest of joy.
Sated with nature's boons, what thousands seek
With dishes tortur'd from their native taste,
And mad variety, to spur beyond
Its wiser will, the jaded appetite!
Is this for pleasure? Learn a juster taste,
And know that temperance is true luxury."

The preservation of health will, of course, consist, in a great measure, in avoiding the remote and predisposing causes of disease: this has been repeatedly detailed in this Manual.

It has been mentioned, that the atmosphere has the power of inducing disease, chiefly through the substances which it holds in chemical solution: many are composed of water, caloric, the effluvia escaping from the bodies and clothes of persons labouring under certain contagious diseases; also the infectious miasma of marshes. In some instances the air is also charged with several mineral poisons, mechanically suspended, and when inhaled into the lungs become a fruitful source of mischief. In illustrating the nature of causation, as tending to interrupt health, it is curious to observe the variety of

opinions among physicians who are equally intelligent. The first sensible effect of disease, is a change in the function of the tissue upon which it acts; yet these symptoms are often attributed to a variety of causes, which is nearly a proof that the real agent has escaped detection. Whenever the cause of disease escapes the vigilance of the inquirer, it is said to arise spontaneously in the animal economy: this can answer no other purpose, but to conceal the ignorance of those who assert it, as it openly contradicts the certain truth—that there is no effect without a cause.

The most desirable methods of promoting longevity, will certainly be in avoiding, as much as possible, the exciting cause of disease. The possession of a sound mind in a sound body has been considered as one of the productive causes of long life. In this particular I fear we cannot be the sole architects of our condition.

> "What nothing earthly gives, or can destroy,
> The soul's calm sunshine, and the heartfelt joy."

This is virtue's prize, of which temperance and mental quietude are essential ingredients; but every person has a predisposition to some complaint or another, and it is our duty to guard particularly against such predisposition. And it will be found to be greatly beneficial to each of

us to protect ourselves against those diseases to which we find, by experience, we are constitutionally predisposed, in order that such tendency may be done away, and that all opportunity of its being converted into disease may be removed. It is also of vital importance, when a person finds himself ill, that he should seek advice of those who are well qualified to give it, and not place confidence in uneducated men who keep medical shops and retail empirical nostrums: these characters have so quartered themselves upon the ignorance of the people, that they have become a public nuisance, which tends greatly to abridge human life. It is generally believed that the profits arising from empirical remedies, and the emoluments of the prescribing druggists at their counters, exceed, in numerical value, the whole of the fees received annually by the fellows of the Royal College of Physicians, in London. If this position be anything near the truth, it is sufficient to appal the reflecting mind with horror; but this subject is too disgusting to be pursued to its consequences: it clearly demonstrates that our faculties have not yet recovered from the ignorance occasioned by the connexion of the Goths and the Vandals. The writings of the elegant Pliny and philosophical Cicero, give correct views of health,

as well as elegant taste, and suggest the means of longevity.

But even longevity itself must come recommended with certain concomitants, in order to be valuable. To those who are conversant in ancient history, instances enough will recur to their imagination of many whose happiness would have best been consulted by an earlier death. Homer, Horace, Cicero, Pliny, Juvenal, and many other classical authors, abound with instances of this truth. With respect to our persons, the enjoyment of health is an essential article to render long life, in any sense, agreeable. The association of ideas, by harrowing up recollections of an unpleasant character, very much diminishes our peace as life advances; because adverse events are continually taking place which no human prudence can either foresee or avoid. The choice of a physician, also, is sometimes critical in your fate; choose one who is your friend in health, as well as adviser in disease: with such a person you will be unreserved in your communication, and place unlimited confidence in him, as he will be greatly interested in your condition; he will use more activity and attention to restore you to health, than the physician who merely acts in the way of his calling. Be on your guard against any physician

who prepares or employs secret medicines, as this is the practice of an impostor. A physician saturated with avarice should be avoided; and if he should play the hypocrite to conceal the absence of morals, beware of such a man as you would shun a monster!

CHAPTER XXIV.

The pernicious Effects of Empirical Nostrums upon the Health of Invalids.

THIS chapter contains matter for very serious consideration, as, perhaps, there is scarcely any one thing that from fashion, custom, habit, or any other cause which has obtained an influence over human conduct, that has produced, and is producing, greater evils in social life, than empiricism, It is a word of Greek extraction, and was to the Greeks, in early times, of fearful import; nor has time diminished either its dangers or its use. Where dwells the boasted march of intellect, when the understanding is continually insulted with the most impudent daring pretensions of impostors, who, while they pretend to restore your health, are making a direct attack upon your credulity and your purse? What encouragement exists for the well educated men who have chosen the profession of medicine or surgery as a business of life, and, in order

to practise with credit and character, have devoted their attention, their time, and their property, to its studies,—when they find themselves completely superseded by some inspired pretender—some ignorant quack? Lord Bacon has long since said, in his work on the advancement of learning, "If the same honours or rewards are given to the fool, which ought to be awarded to the wise, who will labour to be wise?" That the ignorant pretender should be encouraged by the public, is a reproach to the understanding of any people; but that the revenue of any country should be supplied by a stamp duty upon empirical nostrums, instead of taking measures, either of prevention or punishment, can only be explained by exhibiting similar acts of atrocity upon the sentiments of nature; the *auri sacra fames* has the power of making that appear relatively right, which is absolutely wrong.

Every scientific man is well aware that the art of distillation, as far as regards the production of ardent spirits, has produced greater ravages upon health, and given a greater empire to death, than the united scourges of famine or the sword; yet the principle of fecundity is so all-powerful, that many are induced to believe, that distillation is permitted by the wisdom of

governments as a safety-valve for a redundant population. Were the various descriptions of liquors, in which alcohol bears so predominant a part, taxed to prohibition, there would be less of felony, less of moral degradation, less employment for police magistrates and judges, and less occasion for the executioner!—there would be a counterpoise in the reduction of the parochial burthens, and the greater value given to the moral character of the people; but, unfortunately, the produce to the revenue is such as—while it does not prevent the injurious use of spirituous liquors—enriches the coffers of the nation.

The anxiety of invalids to procure relief from the sensations of inquietude and watchfulness, which a state of nervous irritation engenders, too often induces them to seek it from the advertising impostors of the day. Let us analyze the folly of the attempt:—what is the ostensible object of an empirical nostrum? It is presumed to be a specific remedy for a specific disease; it likewise assumes an exact similarity of symptoms and perfect identity of constitution in every one who has the temerity to use it. It is well known that even specific diseases, as they are called, are variously modified by the peculiar idiosyncrasy of individual habits and constitu-

tions; and that it is utterly impossible for the same remedy to produce exactly the same effects in different individuals; nay, even in the same person, under different circumstances, and at different times. These are known truths, and cannot be disputed. Where, then, is the wisdom of banishing the advice of scientific men, who have made the nature of diseases and the efficacy of remedies a study of life, to rely upon the remedies of the empirical nostrum-monger, whose impudence supplies the place of knowledge, and whose very existence depends upon the greatness or mass of credulity with which his dupes are inspired?

It has been observed, that these nostrums are generally employed from caprice, and without judgment or discretion. I do not presume to say that sulphur will not destroy psora; that cinchona, or arsenic, will not relieve or cure intermittents;—but I contend that all remedies should have a certain indication in view. I have continued the existence of a patient for upwards of ten years, labouring under a fatal disease—hydrops pericardii, or dropsy of the chest—by the specific power of foxglove upon his constitution; but I have sought in vain for the efficacy of this remedy in the same disease in other patients;—nay, in this very party, where the

power of foxglove was so completely developed, it was not equally so at all times. How great, therefore, must be the folly of patients in placing confidence in nostrum-mongers who are destitute of all precision of ideas respecting the indications to be held in view, or the remedies to be employed! Within these last thirty-five years a class of men have greatly increased, who are suffered, without molestation, let, or hindrance, to prosecute their craft, by carrying on what they would probably call getting an honest livelihood—viz. giving medical advice and dispensing their drugs as remedies, for ready money, at their counter: these men, under the name of chemists and druggists, flourish greatly in low neighbourhoods, in large capitals, and even in large provincial towns. Some, more influenced by their fears than from any suspicion of their ignorance, are prevented from visiting patients at their own dwellings, having a wholesome recollection of the late Apothecaries' Act. Others dare all consequences, and become what is aptly enough termed *general practitioners*. The solitary qualification necessary for this *honest* mode of existence, is commonly an apprenticeship behind some druggist's counter. Sometimes it has occurred that a shrewd boy, employed to clean bottles and sweep out the shop, has received

an intuitive call, and has felt himself fully qualified for the important office of recovering and regulating the health of many invalids. The writer has a knowledge of a general practitioner of this description who was received behind a druggist's counter, in the manner before related, and perhaps learning audacity from his late employer, has obtained, through the medium of puffing friends, a surreptitious reputation, and is cried up by these worthies as a very skilful and fine man, particularly for nervous invalids, and more especially for the disorders of women and children.

As our invalid regards his future health, or even his very existence, the writer would earnestly entreat him never to take into his stomach any advertised patent medicines whatever—they may all be improper for him: besides, whatever is taken without correct ideas as to the indication, must be wrong. Let him also beware, as he values his health, of receiving any advice or medicines, as a consequence of such advice, from the denomination of persons already described. There are many well educated men, regular graduates of Universities, of high classical attainments, that are passed over by wealthy but ignorant men, as only to be employed when the patient is approaching the

last stage of disease. The practical operation of such conduct is, that the physician is merely called to receive the responsibility of the failure arising, most probably, from the ignorance of the party who has had the conduct of the case from the beginning.

Let me here observe with astonishment, the system of advertisements, as it regards matters of health and disease. How unblushingly daring and fraudulent they are! The cases of disease, hitherto of invariably fatal termination, are exactly the very maladies which the advertiser has discovered a certain method of cure for. Instead of receiving a duty upon such advertisements, on insertion, the insertion should be prevented, and the attempt should be punished by fine or imprisonment: this is the way the public should be protected. At present, fraud and folly are the consequences:—on the one hand, imposition,—on the other, the most unpardonable credulity. I remember once to have seen a most entertaining pamphlet, entitled "A Guide to Health, Beauty, Riches, and Honour;" it was very ironical and satirical, and lashed the impudence of one party and the folly of the other, in a very masterly manner. The pamphlet I have lost: it has long been out of print; but I possess the preface, from which, owing to its very satirical character

respecting advertisements, I shall here give an abstract, not doubting but it will much entertain the reader.

The author begins his observations upon the very great increase of knowledge which has arisen in this kingdom, and the vast improvements that are continually taking place, not only in the arts and conveniences of life, but also in the more abstruse sciences. He appeals, for the truth of his assertion, to the numerous advertisements in the daily papers, and other public notices, wherein these discoveries not only stand uncontroverted by the police, but also in many instances confirmed, and, in a manner, attested, by letters patent ;— circumstances which he presumes could not have happened in a well governed city, if not founded on truth ; and, the more particularly, as many of the medical improvements may materially affect the healths, and even the lives, of many of his Majesty's subjects. In addition to which, the sceptical disposition of the present race of mortals, so much complained of by divines, would certainly not suffer such pretensions, if false, to remain long undetected. Justice, also, here makes it very necessary to observe, and to commend, the spirit of philanthropy which seems to exist among the ingenious professors of

the different arts and sciences, who do not appear in the least to consult their own emolument, but labour solely *pro bono publico*. In short, we seem to be the wisest, wealthiest, and certainly may, if we please, be the very happiest, people under the sun, as it is universally allowed, we are the most generous and disinterested. In evidence of this position, have we not advertisements daily offered to the public, containing invitations to health, beauty, vigour, wives, places, pensions, and honours?—all of which may be obtained for money. And what leaves nothing to be wished for, in this glorious country, is the candid and generous offers of money itself,—that very essential article,—so often made in every part of the metropolis. Some gentlemen, indeed, confine their offers to persons of fashion, upon security *natale solum;* some to ladies and gentlemen only: but much the greater part of these beneficent beings, like the sun and rain, are disposed to dispense their blessings indiscriminately on all. But should a mistaken pride, or any other reason, prevent the acceptance of these kind and disinterested offers, there are gentlemen to be found, for money, deeply skilled in the science of calculation, or the mysteries of the *cabala*, who would most readily direct your choice of the most

lucky numbers in games of chance, or in the lottery, or such other methods of applying your money, as will, to a certainty, ensure your acquiring an independent fortune, without the least risk, and in a very short time! All which advantages they would, doubtless, have long since secured to themselves, were they not actuated by that love for mankind, and contempt of sordid lucre, which always distinguishes true philosophy.

Thus it appears, that the supply of blessings is governed by the *rationale* of the demand. If any lady should happen to exhibit symptoms of an ungraceful shape, we have anatomical stays which will effectually prevent that misfortune, and if deformity have already taken place, we have a modern creation of artists, called machinists—self-taught, inspired geniuses,—who profess to make the deformity instantly disappear; and, in order that all their time may be employed to your benefit, they throw no time away in obtaining anatomical knowledge, which, to an intuitive mind, is quite unnecessary. Not to mention other gentlemen, who will make irregular and decayed teeth give place to others of six different enamels! We have professors, also, who will undertake to raise up fallen noses, or make new ones, at the

choice of the patient. Broken jaw-bones are not allowed to form a callous in the regular way of nature; but mechanical means are employed, which make the bone much the better since the accident! We have one person, who is a great benefactor of mankind; for he absolutely undertakes to cure all and every disorder to which the frailty of our common nature has rendered us liable; and this he offers to prove clearly to our senses, if we are not incorrigibly ignorant, by a process called occult demonstration,—he being (to use his own words) mechanically accurated, and anatomically perfected, in the human structure! We all know—and many feel, to their costs—that the gout is a most painful disease; but we are now happily informed, that an infallible cure has been discovered for that dreadful disorder; and that persons, who are suffering under its paroxysms, so as to be utterly unable to move, may be radically cured, either by the month, the year, or even for life, without any annoyance from medicine, but simply by muscular motion; or by another secret, which the generous possessor offers to disclose to the public for the paltry sum of twenty thousand pounds! In addition to this,—all the disorders contained in the long catalogue of human miseries, will be found to yield to the

stupendous power of the vapour baths of a modern worthy, whence, like Eason from the kettle of Media, the patient springs out totally renovated!!!

We have many other worthies;—the blessings they confer can only be properly known when they are withdrawn. For instance,—under the article of temporary retirements for ladies, many asylums are offered, with assurances of kind entertainment, honour, and secrecy, that do great credit to the feelings of the age; and one *medical* gentleman not only offers his obstetric assistance, but also undertakes to obliterate every vestige of pregnancy; or, on an opposite principle, will, if sufficiently rewarded for the magnitude of the benefit, remove, in the safest and pleasantest way imaginable, the causes of sterility itself in any lady who will submit to his advice and direction, and who wishes to become pregnant.—Thus it is that advertisements become the happy medium by which an almost infinite variety of wants become known; otherwise, they could never be relieved: it also serves to demonstrate our advance—if not to perfection, at least—to perfectibility!

Nor is it possible to accuse those who endeavour to make their powers known, through the medium of advertisements, of any disposition

to a spirit of misanthropy; as there appears a variety of candidates for the holy state of matrimony, who, being devoid of all pecuniary or other unworthy motives, seek only suitable helpmates for the purposes of domestic happiness and economy. Likewise, to show that a want of charity is not a vice of the present generation, there are many proffered retreats for youth and beauty, in the houses of bachelors and widowers. There must, also, be a great propensity to friendship; as may safely be concluded from the advertisements, which now and then appear, for a *real* friend: this establishes the principle, and does the highest credit to the benevolence and amiable disposition of our countrymen!

There are many advertisements which do not altogether, perhaps, reflect honour upon the parties concerned, or that of the country where they are suffered; but even this, like almost every thing else, is matter of opinion: such, for instance, as those relative to seats in parliament; or that of guardians, offering to bestow their wards in marriage upon certain considerations. But the first is no new matter, having been the usage time out of mind; * and as for the

* A late statesman has said in parliament, that trafficking for seats in "that House" was as notorious as the sun at noon-day.

other, what may appear as sordid in the proposal, will serve, like shade in a picture, or discord in music, to form a contrast, and set off the disinterested offers of other advertisers.

Though it may, perhaps, be objected, that some of the outrages upon common feeling, here related, are not now existing; or that the causes have ceased to act; or that the writers are dead;—to this I answer,—that if some causes have ceased to exist, others equally absurd and abominable are every day created by living actors, which many know to their cost. In fine, folly and ignorance, wherever it is to be found, immediately produces a demand for fraud and every species of imposition.

Beware of hypocrisy of every description;—you may as well believe that the Pope can send you to perdition, as that an advertising charlatan can, by any empirical nostrum, restore you to health.

CHAPTER XXV.

MINERAL AND MEDICINAL WATERS.

The principal Places in Great Britain and Europe, celebrated for Mineral Springs and Waters, and generally frequented by Invalids, are the following:—Bath, Bristol, Cheltenham, Harrowgate, Scarborough, Buxton, Epsom, Tunbridge, Matlock, Moffat, Malvern, Holywell, Hartfell, Aix-la-Chapelle, Spa, Pyrmont, Carlsbad, Barege, Seidlitz, Vichy, Seltzen, &c. &c.

BATH WATERS.

The hot springs of Bath have been long esteemed for their salutary efficacy in the removal of various diseases to which the human frame is exposed. The temperature of the hot springs is higher than any others in Great Britain, being from 112° to 116°. The three principal springs are named as follows, viz.—"*The King's Bath*," "*The Cross Bath*," and "*The Hot Bath*."

They are situated at short distances from each other; and having passed through the different baths, the waters flow into the river Avon. All the extensive reservoirs used for the purposes of bathing are supplied every evening from their several springs with fresh water. Dr. Falconer, in his remarks on the *sensible* and *medicinal* properties of the Bath waters, observes, that the water, when newly drawn, appears clear and colourless, remains perfectly inactive, without bubbles, or any appearance of briskness or effervescence: having been exposed to the open air for some hours, it becomes rather turbid, by the separation of a pale yellow-ochery precipitate, which gradually subsides. No odour is perceptible from a glass of the fresh water, but a slight pungency to the taste from a large mass of it, when fresh drawn; which, however, is neither fœtid nor sulphurous. When hot from the pump, it affects the mouth with a strong chalybeate impression, but free from a saline or pungent taste. On growing cold, the chalybeate taste is entirely lost, leaving only a very slight sensation on the tongue, by which it can scarcely be distinguished from common hard spring water. The temperature of "The King's Bath," which is generally preferred for drinking, is, when fresh drawn in the glass,

above 116°: the temperature of "The Cross Bath" is 112°. However, having flowed into the extensive bathing vessels, it is in general from 100° to 106° in the hotter baths, and from 92° to 94° in the Cross Bath. This temperature is mostly stationary, and is higher than that of any other natural hot spring in Great Britain. A small portion of gas is disengaged from the waters, which Dr. Priestley first discovered to contain no more than one twentieth part of its bulk of carbonic acid, or fixed air. The chemical properties of the Bath waters, according to the most accurate analysers,—Drs. Falconer, Gibbs, and Lucas,—contain only one-twentieth or thirtieth part of a grain of iron to the pint; and fifteen grains and a quarter of siliceous earth to the gallon. Dr. Saunders calculates, that a gallon of the King's Bath water contains about eight cubic inches of carbonic acid, and a similar quantity of air, nearly azotic; about eighty grains of solid ingredients, one half of which probably consists of sulphate and muriate of soda; fifteen grains and a half of siliceous earth in the gallon; and the remainder is selenite, carbonate of lime, and a portion of the oxide of iron, so small as to be scarcely appreciable. Hence he concludes, that the King's Bath water is the strongest chalybeate;

next in order, the Hot Bath water; and lastly, that of the Cross Bath, which contains the smallest proportions of chalybeate, gaseous, and saline, but considerably more of the earthy particles, while its water in the pump is also two degrees lower than that of the others. It is also now ascertained, that these springs do not exhibit the slightest traces of sulphur, although it was in former times supposed that the subtle aromatic vapour in the Bath waters was a sulphurous principle, exactly similar to common brimstone. As regards the Bath waters in their action on the human system, independently of their specific properties as a medicinal remedy, Dr. Saunders is of opinion that they cannot be effectually imitated by any chemical preparation; and attributes much of their salutary power to the natural degree of warmth peculiar to those springs, which for ages have preserved an uniform degree of temperature. The doctor also is of opinion, that one of their most important advantages is that of external application. However, in this respect, he admits, so far as his experience would allow, that they differ little from common water when heated to the same height of temperature, and applied under similar circumstances. Dr. Falconer is of opinion, that the Bath water, if

swallowed fresh from the spring, in general raises and accelerates the pulse, increases the natural heat, and promotes the different secretions. These symptoms most frequently become perceptible in a very short time after the draught has been swallowed, and may continue a much longer period. It must necessarily be here remarked, however, that such symptoms are only produced in debilitated constitutions. It may therefore be supposed that the Bath waters possess not alone heating properties, but also that the internal use of them is attended with a stimulant power, more immediately operating on the nervous system. The Bath waters produce the most salutary effects in their action on the urinary and digestive organs, when taken in moderation. Their action on the bowels vary in different individuals, like those of all other waters which do not contain any cathartic salt; but generally they are productive of costiveness—an effect resulting from the want of an active stimulus to the intestines, and probably, also, from the determination which these waters occasion to the skin, more than from any astringency which they may possess; for if perspiration be suddenly checked during the use of them, *diarrhœa* is sometimes the consequence. Hence it appears, that their stimulant powers are primarily, and

more particularly, exerted on the stomach, where they produce a variety of symptoms—sometimes slight and transient, but occasionally so considerable and permanent as to require them to be discontinued. With those constitutions which are benefited by the use of the Bath waters, their first excitation is an agreeable glowing sensation in the stomach, which is speedily succeeded by an increase of appetite and spirits; and also a quick secretion of urine. In other constitutions, when the use of them is attended with headache, thirst, and constant dryness of the tongue, heaviness, loathing of the stomach, and sickness, or if the waters be not evacuated either by urine or an increased perspiration, it may be naturally inferred that the further use of them must be injurious. The Bath waters are strongly recommended by the faculty for the removal of numerous diseases, some of which are the most difficult of cure that have been submitted for medical treatment; and in all extreme cases the baths are used as well as the waters; thus affording the benefit of external and internal purification in their medicinal process. The general indications, pointing out the proper use of these medicinal waters, are those cases where a gentle, gradual, and permanent stimulus is wanted. The Bath

water may certainly be considered as a chalybeate, in which the iron is very small in quantity, but in a highly active form; and the degree of temperature is in itself a stimulus, frequently of considerable power. These facts prove the necessity of certain caution, which, from a view of the mere quantity of foreign contents, might be considered superfluous. Although, in extending the powers of this medicine, allowance must be made for local prejudice in its favour, there can be no doubt that its employment is hazardous, and might often do considerable mischief, in various cases of active inflammation, particularly in irritable habits, where a strong tendency to hectic fever exists; and even in the less inflammatory state of disease and suppurating viscera, as in the lungs, liver, &c., and also, generally where a quick pulse and parched tongue are indicative of a certain degree of fever. The cases, therefore, to which the Bath water is peculiarly adapted, are those of the most chronic or tedious nature; and by a steady perseverance in this remedy, some of the most obstinate diseases have been removed. In the Treatise on Mineral Waters, by Dr. Saunders, the following are, in his opinion, the principal:—chlorosis, or green sickness, a disease which at all times is much relieved by steel, and will

bear it, even when there is a considerable degree of feverish irritation, receives particular benefit from the Bath water; and its use, as a warm bath, excellently contributes to remove that languor of circulation, and obstructions of the natural evacuations, which constitute the leading feature of this general and debilitating disease. The complicated disorders which are frequently brought on by a long residence in hot and tropical climates, affecting the secretion of bile, the functions of the stomach, and alimentary canal, and which generally produce organic derangement in some part of the hepatic system, or region of the liver, frequently derive much benefit from the Bath water, if taken at a time when the suppurative inflammation is not actually present. The jaundice, another but less active disease of the biliary organs, which originates in consequence of a simple obstruction of the gall-ducts, is even more frequently removed by the internal, as well as external, use of the Bath waters. Dr. Charleton has judiciously remarked, that the power of the Bath waters, in rheumatic complaints, is principally confined to that species of rheumatism which is unattended by inflammation, or in which the pains of the patient are not increased by the warmth of his bed. A great number of

the invalids who resort to Bath, especially those who are admitted into the hospital, are affected by rheumatism, in all its stages; and it appears, from the best authenticated authority, that the major part of them have been discharged, permanently cured. In those cases of gout where the disease produces anomalous affections of the head, stomach, and bowels, the greatest benefit is derived from the Bath water; and here it is a principal advantage to be able to bring, by warmth, that active local inflammation in any limb, which relieves all other dangerous and troublesome symptoms. Hence it is that Bath water is commonly said to produce the gout; by which is only meant, that where persons have a gouty affection, shifting from place to place, and thereby much disordering the system, the external and internal use of the Bath water will soon bring on a general increase of action, indicated by flushing in the face, fulness in the circulating vessels, and relief of the dyspeptic symptoms; and the whole disorder will terminate in a regular fit of the gout in the extremities, which is the crisis to be wished for. The palsy, or loss of nervous power in particular limbs, which is one of the most serious consequences, is found to be much relieved by the use of the Bath waters; but

more particularly if externally used, and applied either generally or to the part affected. Dr. Falconer recommends that the quantity of Bath water, to be taken each day, should not exceed from one pint and a half to two pints; and, in chlorotic invalids, with irritable habits, not more than one pint should be used daily; and when the bath is also used, it is to be employed in the morning, twice or thrice a week. Before a fair and full trial can be made of their effect, they require a long time to be persevered in. Chronic rheumatism, habitual gout, indigestion from a long course of high and intemperate living, and the like, are diseases not to be removed by a short course of any mineral water; and many of those who have received benefit at the fountains, find it necessary to pay an annual visit to them, to repair the waste in health during the preceding year.

THE BRISTOL HOT WELL WATERS.

The Bristol hot well is a clear, warm, lightly acidulated, mineral spring, situated about one mile from the town of Bristol. The fresh water has no smell, is sparkling and limpid, and, when poured into a goblet, sends forth a quantity of

air-bubbles. It is very palatable, but appears quite tasteless to a common drinker. Its specific gravity is only 1.000-77, which approaches so nearly to that of distilled water, that this fact alone must show that it contains a very small quantity of foreign ingredients. The temperature of the Bristol waters, taking the average o the most accurate observations, may be computed at 74°; which temperature does not perceptibly vary during summer and winter. The Bristol waters contain both solid and gaseous matter; and the distinction between the two should be attended to, as it is owing to the very small quantity of solid matter that it merits the character of a very fine natural spring; and, to an excess in gaseous contents, that it is materially indebted for its medicinal properties, whatever they may be, independently of those of mere water, with an increase of temperature. From the most minute investigations, by different eminent chemists, it would appear that the principal component parts of the hot well water are a large proportion of carbonic acid gas, or fixed air, and a certain portion of magnesia and lime, in various combinations with the muriatic, vitriolic, and carbonic acids. The general inference is, that it is very pure for a natural fountain, as it contains no other solid matter

than is found in almost all common spring water, and in less quantity. From the ingredients which it contains, the hot well water is efficacious in promoting salutary discharges in chlorosis, or green-sickness, and also in the blind piles. It may be used beneficially in obstructions and weakness of the bowels, arising from habitual costiveness; and, from the purity of its aqueous part, it has been deservedly esteemed in diabetes (immoderate discharge of urine); rendering the urinary organs better fitted to derive benefit from those medicines which are usually, and sometimes successfully, prescribed. From the number of unsuccessful cases, among those who frequent the hot well, many have denied any particular benefit in this spring superior to that of common water. It is difficult to determine how much may be owing to the favourable situation and mild climate which Bristol enjoys; but it is a certain truth, that the hot well water, though by no means a cure for consumption, alleviates some of the most harassing symptoms of this formidable disease. It is particularly efficacious in moderating the thirst, the dry, burning heat of the hands and feet, the partial night sweats, and the symptoms that are peculiarly hectical; and thus, in the earlier stages of pulmonary

consumption, it may materially contribute to a complete re-establishment of the health; and, even in the latter periods, mitigate the disease, when the cure is doubtful, if not hopeless. If the hot well water be drunk fresh from the spring, it creates a gentle glow of the stomach, succeeded occasionally by a slight, transient degree of giddiness and head-ache. But, in general, by a continued use, it is diuretic, keeps the skin moist and perspirable, and improves the appetite and health. Its effects on the bowels vary in different constitutions: it is the prevalent opinion, that a tendency to costiveness seems to be the more general consequence of a long course of this medicinal spring, which requires the use of some mildly aperient medicine. These effects are, however, applicable only to invalids; for healthy persons, who drink the water at the fountain, seldom discover any effect from it, except a degree of warmth which distinguishes it from common water. Although the medicinal properties of the hot well continue the same throughout the year, yet it is frequented generally from the middle of May to the beginning of October, as invalids prefer the summer and autumnal months for the benefit of the mild air and temperate climate. There is also another spring, called Sion Spring, which is situated at

Clifton, on the top of the hill, from the base of which the hot well issues. The Sion water is about two degrees colder than the Bristol hot well; but its medicinal effects operate in the same manner, and it is used in like cases, as those of the Bristol waters.

THE CHELTENHAM WATER.

The Cheltenham water possesses both saline and chalybeate properties, and is every year increasing in reputation from its admirable aperient efficacy and salutary effects on invalids. It is clear and without colour, but brisk and sparkling when first drawn, and has a saline, rather bitter, chalybeate taste. It will not keep, nor bear transporting to any distance, the chalybeate part being lost by precipitation of the iron; and, when exposed for a short space of time to atmospheric air, it becomes fœtid. The salts, however, retain their strength, &c. The heat of the Cheltenham water, in summer, was from fifty to fifty-five degrees, or even fifty-nine, when the medium heat of the atmosphere was nearly fifteen degrees higher. It is found to contain a calcareous earth, mixed with ochre and a purging salt, on evaporation. A general

survey of the component parts of this water, according to various analyses of it, proves that it is decidedly saline, and contains much more salt than most mineral waters. By far the greater part of the salts are of an aperient nature; and consequently an action on the bowels is a constant effect, notwithstanding the considerable quantity of selenite and earthy carbonates which may be supposed to produce a contrary tendency. Cheltenham water is also one of the strongest chalybeates that we know of: the iron is suspended entirely by the carbonic acid, of which the water contains about one-eighth of its bulk. Perhaps from the very strong chalybeate qualities of this water may arise those somewhat disagreeable symptoms common on first taking it. The sensible effects produced by it are generally on its first use; a degree of drowsiness, and sometimes headache, but which soon go off spontaneously, even previously to the operation on the bowels. A moderate dose acts powerfully and speedily as a cathartic, without occasioning griping, or leaving that faintness or languor which frequently succeeds the action of the rougher cathartics. It is principally on this account, and partly also from the salutary operation of the chalybeate, and, probably, the

carbonic acid, that the Cheltenham water may, in most cases, be persevered in, uninterruptedly, for a considerable length of time, without producing any inconvenience to the body; and, during its use, the appetite will be improved, the digestive organs strengthened, and the whole constitution invigorated. If a dose of this water be taken in too small a quantity to operate on the bowels, it will frequently determine very powerfully to the kidneys. The season for using the Cheltenham water is during the whole of the summer months. The dose of the water, as an aperient, is from one to three pints, in general. Half a pint contains half a drachm of neutral purging salts, four grains of earthy carbonates and selenite, about one-third of a grain of oxyd of iron, together with an ounce, in bulk, of carbonic acid, and half an ounce of common air, with a small portion of sulphuretted hydrogen. The Cheltenham water is employed with considerable benefit in a variety of disorders, particularly in those of a chronic and bilious nature; for this reason it has been found of essential service in the cure of glandular obstructions, and especially those that affect the liver and the organs connected with the functions of the alimentary canal. Persons who have injured their biliary organs by a long

residence in hot climates, and who are suffering under the symptoms, either of excess or deficiency of bile, and an irregularity in its secretion, receive the greatest benefit from a course of this water judiciously administered. Its use may, in such cases, be continued even during an excessive degree of debility; and from the powerful determination to the bowels, it may be employed with advantage in checking the incipient symptoms of dropsy and general anasarca, (dropsy of the cellular membrane,) which so frequently arise from obstructions of the liver. In painful affections of the skin, termed scorbutic eruptions, which make their appearance at certain periods, producing a copious discharge of lymph, and an abundant desquamation,—in common with other purgative saline springs, the Cheltenham water is found to afford relief; but it must be constantly persevered in, by keeping up a continual determination to the bowels, and by also using the warm bath. In scrofulous complaints, the sea water is by far more efficacious in remedial properties than any other.

THE HARROWGATE WATERS.

High and Low Harrowgate are villages situated in the neighbourhood of Knaresborough, in

Yorkshire. These villages have long enjoyed considerable reputation for two kinds of salutary springs. Not very many years ago the chalybeate spring was the only one that was used internally, and the sulphureous spring employed solely for external applications. Of late years, however, it has been used with great benefit internally. There are four sulphureous springs in Harrowgate, all of the same quality, but varying in the degree of their power. The water, when first drawn, appears quite clear and transparent, and emits a few air-bubbles. It has a very strong and foul sulphureous smell, not unlike that of bilge-water. It is, at first, nauseous, bitter, and very saline; but, after repeated draughts, the invalid does not find it in the least unpalatable. When a few hours exposed to the open air, this water loses its transparent appearance, and is changed into a greenish colour, its sulphureous smell goes off, and the sulphur may be seen deposited at the bottom and on the sides of the vessel that contains it, somewhat in the form of a thin filmy substance. Its volatile productions exhibit carbonic acid, sulphuretted hydrogen, and azotic gas. The sensible effects which the Harrowgate waters produce, on being first used, are, headache and giddiness, succeeded by a mild and

speedy aperient operation, unattended by griping. The Harrowgate springs are employed in various disorders, especially in those of the alimentary canal, and the irregularity of bilious secretions. From the judicious use of these mineral waters, the spirits, appetite, and general health, improve; and, from its salutary aperient properties, it would, doubtless, be productive of the greatest benefit in removing the costive habits of invalids labouring under hypochondriasis. But its highest reputation is in removing cutaneous disorders; and, for this purpose, it is universally employed as an internal medicine, and externally by the use of the bath. In this united form it is efficacious in the most obstinate and complicated diseases of the skin. It is also a powerful antidote against those diseases, where worms are supposed to have originated them; especially the round and maw-worms, if a sufficient dose be taken to produce a brisk purging; and, in the case of maw-worms, if the Harrowgate water be applied as a clyster, these worms, being principally confined to the rectum, will be completely expelled or destroyed by this mode of application. These waters have been many years held in the highest estimation for the removal of hæmorrhoidal affections, from the union of their saline and sulphureous pro-

perties. The Harrowgate water should be used in such quantities as to produce sensible effects on the bowels; half a pint taken in the morning, and repeated three or four times, will be sufficient. Its unpalatable flavour may be corrected by chewing a biscuit, or a crust of bread, after drinking it. In cases of chronic affections, the Harrowgate waters must be persevered in for some months before recovery can be reasonably expected.

THE SCARBOROUGH WATERS.

The springs at Scarborough, in Yorkshire, possess ferruginous, or iron properties: they are two kinds of chalybeates, differing very much in their component parts, although rising in the immediate vicinity of each other. The one is a simple carbonated chalybeate, similar to the Tunbridge Wells water; the other, which is in greater repute, and more frequented, is generally known by the exclusive name of the Scarborough water; and it has, in conjunction with the iron properties, a considerable proportion of a purging salt, which essentially enhances its value. The disorders for which the Scarborough water is particularly

recommended, are similar to those for which the Cheltenham water is prescribed; with this difference, however,—that the purgative effects of the Harrowgate water must be increased by an additional portion of its own salts;—for this reason, the Harrowgate water operates, in its natural state, only as a mild, alterative medicine. Scarborough commands a great advantage over Cheltenham, as regards the salutary objects of sea-bathing; the employment of which, in addition to the mineral benefits of the spring, in many instances, tends considerably to promote the effectual cure of various diseases; whereas, without this conjoint benefit, such cures would, at least, be very tedious.

THE BUXTON WATERS.

Dr. Bulleyn, in the "Book of Simples," has given the first account of these waters during the reign of Henry VIII. He therein stated, that the Buxton waters "had done many and sundry good cures, both to the sore and lame." They are thermal mineral springs, which rise in Derbyshire; and, as appears from Dr. Bulleyn's remark, have been in long repute for their healing properties. As to their sensible properties, the Buxton waters cannot be distinguished from

common spring water when heated to the same degree of temperature. The gentleman's bath is constantly 82 degrees. A large quantity of elastic vapour rises and forms bubbles that pass through the water, and burst as soon as they reach the surface of the spring. Dr. Pearson says, that the air which inflates these bubbles consists of azotic gas, mixed with a small portion of atmospheric air. These waters are often used, externally and internally; as a bath alone, their powers are not superior to common water of the same heat. As the temperature of 82 degrees is several degrees below that of the human frame, a slight shock of cold is felt on first entering the bath; but it is quickly succeeded by a pleasant glow over the whole body: on this account it is well adapted for very delicate or irritable habits. In cases where the chronic rheumatism has succeeded the acute, and where the inflammation has been seated in particular limbs, the external use of the Buxton bath affords wonderful relief. In cases of indigestion and derangement of the alimentary organs, the internal use of the Buxton waters is productive of most salutary effects: they also relieve heartburn and flatulence, and will increase the appetite, enliven the spirits, and improve the health. At first, however, it not unfrequently

causes a diarrhœa, which is more wholesome than otherwise; but it more frequently causes costiveness, especially in phlegmatic habits. The Buxton waters, taken internally, also afford great relief in painful diseases of the kidneys and bladder, and have been also recommended in cases of gout. When taken internally for the above complaints, the addition of some aromatic tincture is recommended. In all cases of active inflammation, these waters should never be employed—on account of their supposed heating properties. A full course of the Buxton water consists of two glasses, each containing one third of a pint, before breakfast; which should be repeated in the same quantity between breakfast and dinner. In chronic complaints, the patient should reside for a length of time in the vicinage of the spring, in order to insure a complete recovery.

EPSOM WATER.

There is nothing sulphureous or metallic ever found in this spring. The water, when evaporated to dryness, leaves a residuum, the quantity of which has been estimated from 1½ oz. to 5 drachms and one scruple. Of the total residuum, by far the greater part,—about five-sixths,

—is sulphate of magnesia, mixed with a very few muriates, as those of lime, &c., which render it very deliquescent, and increase the bitterness of taste, till purified by repeated crystallizations. The diseases in which the Epsom water is used, are crudities of the stomach, hypochondriasis, stoppage of the menses, and the anomalous complaints succeeding their total cessation at what is vulgarly called the "turn of life," in puffy tumours of the legs of literary men and others who lead sedentary lives, in hæmorrhoidal affections, and scorbutic eruptions.

TUNBRIDGE WELLS WATERS.

Tunbridge Wells, a village in Kent, contains several chalybeate springs, all resembling each other in chemical properties. The two chiefly used yield about a gallon of water in a minute, which quantity affords a copious supply for the numerous patients who every year visit the Wells. The analysis of this spring proves it to be of pure water, as regards the quantity of solid it contains; and its saline contents (the iron excepted) are such as may be met with in any common water, from which it differs only in its being a chalybeate, and from the quantity of carbonic acid it contains.

The Tunbridge water increases the power of the different secretions in a gradual, uniform manner, and imparts tone and strength to all the functions: it is, therefore, useful in irregular digestion and flatulency; in the early stages of those diseases which are accompanied with great debility: in chlorosis, or green-sickness, and various other complaints incidental to females, it is also recommended. The dose varies at each time, from about one to three quarters of a pint, according to the age, sex, and general constitution, of the patient. The whole of the quantity daily used, is taken at two or three intervals, beginning at eight o'clock in the morning, and ending at noon. This mode of use, from extensive experience, is considered the most judicious.

MATLOCK SPRING WATERS.

The numerous springs at Matlock, a village in Derbyshire, are of an acidulous class: they issue from a limestone rock, near the banks of the Derwent. Many of these springs possess a temperature of sixty degrees. Their sensible properties differ little from good spring water. They are quite transparent, and exhale no vapour, except in cold weather. They contain

little or no excess of aërial particles. The water curdles soap when first drawn; but it loses this effect when long exposed, from the deposition of its calcareous salts. When tasted, it appears to differ very little from good spring water; and its effects are owing to its temperature. Therefore, it forms a warm bath for nervous, irritable, and debilitated constitutions. It is recommended after the use of Bath and Buxton waters, as a preparatory course for sea-bathing.

THE MOFFAT WATER.

Dr. Garnett, in his "Analysis of the Moffat Water," (which springs in a village of the same name, about fifty-six miles south-west of Edinburgh), remarks, that a wine gallon of it contains thirty-six grains of muriate of soda, five cubic inches of carbonic acid gas, four of azotic gas, and ten of sulphuretted hydrogen. From the simplicity of its properties, its effects are somewhat similar to those of Harrowgate. On this account it is, that it soon loses that gas, on which depends the greatest portion of its medicinal efficacy. The only sensible effect of the Moffat water is, that of increasing the flow of urine: when it purges, it arises more from the excessive dose, than from its mineral

ingredients. It is chiefly used in cutaneous eruptions; and as an external application, at an increased temperature. In scrofula in its early stage, irritable ulcers, dyspepsia, and where there is a loss of tone in the alimentary canal, the Moffat water is highly esteemed for its medicinal virtues.

MALVERN HOLYWELL WATER.

The Holywell spring, which rises in the village of Great Malvern, has for many years been celebrated for its salutary virtues. By various analyses it appears, that its properties are as follow, viz.—some carbonic acid, which is in an uncombined state, capable of acting upon iron, and of giving a little taste to the water; the exact quantity of which, however, has not been ascertained: a very small portion of earth, either lime or magnesia, united with the carbonic and marine acids; a little neutral alkaline salt; and a very large proportion of water. No iron or metal of any kind is found in it, though there are chalybeates in the neighbourhood. If this water be kept exposed, even a short time, its smell becomes very offensive, notwithstanding its apparent purity. The

Malvern Holywell water is principally applied externally, and occasionally internally. It is very salutary in painful and severe ulcerations, the result of scrofula, attended with local irritation and fever. When applied to the ulcers, it diminishes the quantity of the discharge, corrects the form, smell, and substance, which so peculiarly mark a caries of the bone, promotes the granulating process, and a wholesome exfoliation of the carious part. By long use of this water, very desperate and chronic cases have been finally cured. Persons, also, afflicted with sore eyes, — particularly those produced by scrofulous ophthalmia,—have been effectually recovered, by a persevering use of the Holywell water. Cutaneous diseases and dry desquamations, which often succeed sudden cold in irritable habits, where there is unusual irritation of the skin, have received considerable benefit from the use of the Malvern water. The great advantages arising from it, as an external remedy, has caused the application of it internally, with great success, in cases where painful affections of the kidneys and bladder, attended with discharges of foul, bloody, and purulent urine, or very large and irritable sores on the surface of the body, and long-standing fistulæ, hitherto neglected, and con-

verted into constant and troublesome sores, have occurred. These waters vary in their purgative effects on the bowels: they often purge briskly for a few days; and the body is sometimes rendered costive by using them, particularly with those who drink malt liquors. For all cases, however, the water is a salutary diuretic, and promotes the general health of the invalid.

THE HARTFELL WATERS.

This mineral spring is near Moffat, in Dumfriesshire, and contains iron, dissolved by sulphuric acid: it is very efficacious in scrofulous and cutaneous diseases; and is used both internally and externally. When these waters are first used, they cause drowsiness, giddiness, and slight headache; but a gentle purgative will soon remove these symptoms. It is a good diuretic, and increases appetite. In ulcers of long standing, in those places where the texture of the diseased part is very lax, and the discharge excessive and ill conditioned, this water has acquired great reputation. The dose is less than that of most of the other mineral springs that are used medicinally. In delicate and irritable habits it is necessary to begin with a very small dose, as an over one will occasion griping and

uneasiness in the intestinal canal. Besides, the Hartfell water is never used as a direct purgative. Few patients, even of the most robust habits, can bear more than an English pint of it in the course of the day: this quantity may be long continued. If the stomach of the invalid be very weak, it would be well to make the water tepid; and this process will not at all affect its medicinal properties.

AIX-LA-CHAPELLE WATERS.

These springs arise in Aix-la-Chapelle, a town situate in the south of France. The colour of the water is clear; the smell sulphureous; and the taste saline, bitterish, and alkaline. The temperature varies very much, according to the distance from the source, and the spring itself. In the well of the hottest bath it is, according to Lucas 136°, according to Monnet 146°, and at the fountain, where it is drawn for drinking, it is 112°. These waters are much frequented by invalids, for the numerous symptoms of disorders of the stomach and biliary organs, which are the result of high and luxurious living; also in nephritic cases, which produce pain in the loins, and thick mucous urine, with great pain in voiding it. From the excessively

heating qualities of these mineral springs, the use of the water should be carefully avoided in all cases of an inflammatory nature—such as in hectic fever, and ulceration of the lungs, and where there is a disposition to active discharges of blood. As a hot bath, these waters are more extensively used than as an internal medicine: they possess temperature of any degree that can be borne, and a strong impregnation with sulphur in its most active form, and a quantity of alkali, which gives it a very soft soapy feel, and renders it more detergent than common water. It is, therefore, very efficacious in stiffness of the joints and ligaments, caused by previous inflammation of gout and rheumatism, and in the debility of palsy, where the greatest degree of heat that the skin can bear is required. The sulphureous matter renders it highly active in almost every cutaneous eruption, and, in general, in every species of foulness of the skin. In these last affections, the internal use of the water is as necessary as the bath. The waters of Aix are also much, and beneficially, employed in the distressing debility arising from a tedious course of mercury, and excessive salivation. As to quantity or dose to be taken, and degree of temperature to bathe in it, in all cases it is safest to begin with small

quantities, and low degrees of heat, and afterwards to increase them gradually, according to the invalid's constitution, and the effects which they produce. The usual periods of the year for using these waters are from the 1st of May to the 1st of June, and from the early part of August to the close of September.

THE SPA WATERS.

The waters of Spa, in Germany, possess strongly acidulous chalybeate properties, containing more carbonic acid and iron than any other mineral springs. The waters are the same in property and effect as chalybeates are in general.

THE PYRMONT WATER.

This mineral spring rises in the village of Pyrmont, in the kingdom of Westphalia, in Germany. The water has an agreeable but strongly acidulated flavour, and emits a considerable portion of gas, which is so powerful, that it not only affects persons who drink the water, but actually creates a dizziness in the heads of those who stand near the spring. The Pyrmont water is a highly carbonated chaly-

beate, and contains so great a proportion of carbonic acid, as not only to hold a number of carbonic salts in solution, but to show all the properties of this acid uncombined, and in its most active form. It is likewise a strong chalybeate, as regards its proportion of iron, independently of its being a very hard water, and containing much selenite and earthy carbonates. It is most efficacious in the removal of all stages of debility, which require an active tonic, not permanently heating; such as diseases of the alimentary canal, bilious vomiting, diarrhœa, and complaints arising from obstructed menstruation. The dose is by glassfuls, taken in the morning, to the extent of two, three, and even sometimes four, English pints. The operative effect is strongly diuretic; and, if taken too freely, it mostly proves laxative. Should the patient find it necessary to use it so copiously, a small portion of purgative salts should be mixed with it.

THE BARÈGE HOT SPRINGS.

In the village town of Barège, situate on the French side of the Pyrenees, there are four hot springs, celebrated for their salutary properties. They are all sulphureous, and, according to the

component quantity of sulphur in each, the temperature varies. The coldest of the Barège springs raises Fahrenheit's thermometer to 73°; the hottest to 120°. They are remarkable for a very smooth soapy feel, and render the skin pliable and supple. They are held in high repute when used externally, as a bath, for the removal of various tumours, rigidity and contractions of the tendons, stiffness of the joints, from gouty, rheumatic, and cutaneous affections, &c. When used as an internal medicine, the water from the Barège spring, in most cases, removes diseases of the stomach, accompanied by heart-burn and acidity; also colics of long standing; gravel, jaundice, &c.; and in all cases where the urinary organs are affected.

THE SEIDLITZ WATERS.

Upon a critical analysis of the Seidlitz water, it proves to be impregnated with sulphate of magnesia and muriate of magnesia, which gives it a saline and bitter flavour and those purgative properties, for the salutary effects of which it is held in such high estimation. The principal diseases, for the removal of which the Seidlitz water is recommended, are the same as

those for which the *Epsom waters*, in this country, are held in such high reputation.

THE VICHY WATERS.

These tepid mineral springs arise in the neighbourhood of Vichy (from whence they take their name), in France. The water is mostly used as an internal medicine, on account of its alkaline and chalybeate properties. The principal diseases for the cure of which it is generally esteemed, are, a relaxed state of the stomach, bilious colic, diarrhœa, &c. As a tepid bath, it is also most successfully used in gout, sciatica, rheumatism, &c.; and in these last complaints, when various other remedies have failed, the Vichy waters have effected the most astonishing cures.

THE SELTZER WATER.

This water is highly acidulated with carbonic acid, and a small portion of alkali: it contains more of the carbonic acid than is sufficient to saturate the alkali and the earths it holds in solution. It holds a high reputation in relieving symptoms indicative of a morbid affection of

the lungs, cutaneous eruptions, attended with fever, foulness of the stomach, bilious vomiting, heartburn, acidity of the stomach, spasmodic pains, fœtid and sanguinous stools, &c. It is also recommended in diseases of the urinary organs, particularly for stone in the bladder, as it relieves spasmodic pains, possibly from its alkaline properties, by its rapid determination to the kidneys. The medical men in this country strongly recommend it as an antidote to the above-named diseases.

CHAPTER XXVI.

A FEW

SELECT AND SIMPLE PRESCRIPTIONS

USEFUL TO INVALIDS AS OCCASION MAY REQUIRE.

CATHARTIC PILLS OF VARIOUS POWERS.

A Strong Purgative Pill.

Take of compound extract of colocynth, two scruples;
calomel, ten grains;
gum gamboge, five grains.
Make them into twelve pills.

This pill is very powerful in its action, and should only be used by invalids in cases where there is a torpidity of the intestines, and in obstinate costiveness. One is a moderate dose, two a full dose, and three a very powerful one. Men in strong health may safely use them as an occasional purgative.

A Mild Purgative Pill.

Take of aloetive pill with myrrh;
best rhubarb—of each, a drachm.

Make into pills with a small portion of syrup and soap. From two to four are a dose.

These are very safe pills.

Mild Laxative Pills.

Take of rhubarb, one drachm;
hard soap, half a drachm;
essential oil of cinnamon, three drops.

Make into pills with a little syrup. One to three, a dose.

These are safe and gentle in their operation.

DIURETIC PRESCRIPTIONS.

Take of squill pill, half a drachm;
foxglove, in powder, six grains;
calomel, four grains.

Make into twelve pills. Two repeated twice a-day is the dose.

The action is to increase the quantity of urine; and the pill will be found useful when that fluid is secreted slowly and is thick and turbid: but let it be especially remarked, this, as well as all diuretics, must never be used by an invalid when there is pain about the inferior parts of the abdomen, or in making water, unless under the direction of a medical practitioner.

Mild Diuretic Powder.

Take of supertartarite of potass, two drachms;
put into a little water.

This is a safe diuretic.

SUDORIFIC PRESCRIPTIONS.

A Mild One.

Take of Dover's powder, ten grains.

This powder, taken at bed-time, with a warm drink, produces a free perspiration; it also induces a tranquil sleep. It is particularly useful in rheumatism. As there is opium in its composition, it may produce costiveness; therefore a laxative medicine ought to be used on the following day, unless the bowels be open.

Another.

Take of the water of acetate of ammonia, two ounces;
antimonial wine, twenty-five drops;
cinnamon water, six ounces;
a little syrup of saffron.
Make into a mixture.

The dose is two table-spoonfuls every two hours; giving warm drinks. It must be only taken in bed. It is highly beneficial in slight feverish attacks.

EMETICS.

A Strong One.

Take of ipecacuanha, twenty-five grains;
tartarite of antimony, two grains.
Mix.

A Mild One.

Take of ipecacuanha, twenty grains.

Another.

Take of tartarite of antimony, five grains;
water, two ounces.
Mix.

The patient must take a table-spoonful every ten minutes until it operates.

STOMACHIC CORDIAL.

Take of tincture of bark, two drachms;
tincture of rhubarb, three drachms;
compound spirit of lavender, ten drops.
Mix.
This is a dose.

Its effect is to elevate the spirits, to restore the stomach to its tone, and produce a gentle laxative effect. It should be taken in the middle of the day.

With the exception of the above simple medicines, and such like, I would recommend invalids to be cautious in

using any prescriptions without the advice of medical practitioners. There are so many conditions of disease and of health, that no general rule can be given for the use of any medicine. The above, however, may be used safely, and with great advantage, by any judicious person, who shall have first studied, attentively, the principles laid down in this Manual.

THE END.

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> Wax grey and ghastly, withering ere their time,
> And perish with the reed on which they leant;
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